University of Alberta

Health and Environmental Risk Perception in the Athabasca Oil Sands

by

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Abstract

The Wood Buffalo region of Alberta, Canada is home to the largest oil sands deposits in the world. In recent decades, development of this resource has stimulated rapid industrial, commercial and residential growth in the town of Fort McMurray. A soaring population with varied backgrounds has migrated to northeastern Alberta in search of employment in the Athabasca oil sands and accompanying infrastructure. With these diverse backgrounds come varying perceptions of risks to human and environmental health. Social science literature suggests that risk perception is based on social processes and lived experience rather than on scientific research and statistical calculations. My ethnographic fieldwork supports the idea that perceptions of health and environmental risk are situated in particular ways of being in the world. Interpretations of the concept of health are fluid and amorphous, and residents are just as concerned with social wellbeing as they are about physical states of health.

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Chapter 1: Introduction

So everybody's kind of, I think living with industry. That's how it is. It's kind of being realistic because the social impact here and the environmental impact on people, a lot of people come here and they treat, I think they treat Fort McMurray like a, what do you call it, it's like the Gold Rush. They're going to be here, and then in ten years they're going to be gone and the local people will be here.

JA, Fort McMurray, August 2004

The citation above is from a conversation I had with a longtime resident of Fort McMurray, Alberta, as part of fieldwork for this thesis. I had asked JA to tell me about what risks to health and environment existed in the community that had been her home since birth; rather than list specific diseases or environmental impacts, she spoke about the risks posed to her world as a whole. She discussed impacts as varied as poverty, homelessness, alcoholism, domestic violence, lack of access to traplines, racism, unemployment and air pollution as being introduced by industry and its accompanying workforce. In voicing her concern for the long-term wellbeing of her community in its entirety, she challenged the original framework of this research, which was perceived health risks from industrial development; research instead should holistically address a richer ethnographic portrait in order to better understand the contexts in which such perceptions are situated. For JA, risks to her self and her world are conceptualized as part of a broader setting in which individuals and the environment must fight a losing battle against the forces of industrial development that she thinks ravage and then abandon one's home.

While JA was a strong voice and key informant in my research, hers was just one of many viewpoints I encountered in my time in Fort McMurray. This thesis documents the variability of perceptions residents expressed to me in research on health and

environmental risk perception in the Athabasca oil sands. In this community composed of residents from divergent backgrounds, I encountered wide-ranging differences in perceptions of health risk, from individuals who attribute cancer and lupus to the oil sands developments, to those who believe they suffer no ill effects from their proximity to the industry.

I have taken as my guiding influence Mary Douglas and Aaron Wildavsky's *Risk and Culture* (1982), a book that emphasizes the social and cultural contexts of risk. The authors maintain that risks are selected for concern based on particular worldviews; there are too many possible risks to worry about all of them, and so people must choose a few that fit with their way of understanding the world. Probability and scientific calculations do not have the most influence on what risks are selected: we know that many people are killed daily in automobile accidents, and yet many of us drive every day. The likelihood of being exposed to and suffering the ill effects of anthrax spores is quite low, but the issue has drawn considerable media coverage and public concern since the biological pathogen was found in Washington, DC in 2001. The perception of risks, then, has more to do with social and cultural realities than probabilistic or rationalistic scenarios. Douglas and Wildavsky stress that risks are not knowable quantitatively and are not mechanically ranked by people in their daily lives. My project is consequently a qualitative approach to the perception of risks in the industrial "frontier" where livelihoods are transformed, for better or worse, through very large-scale industrial development. Through participant observation and informal interviews, I learned about risk perceptions in a different light than that shed

in quantitative approaches.

I selected Fort McMurray, Alberta, Canada as a research site because of its proximity to the Athabasca oil sands; my original goal was to learn about what, if any, role the oil and gas industry played in residents' perceptions of health and environmental risk, and there is no community in Canada so inextricably tied to the industry. Fort McMurray owes its contemporary existence to the development of the oil sands, and the majority of its residents are employed either directly or indirectly by oil sands companies. Construction began in the 1960s and has continued at a rapid pace, with more mega-projects planned in the near future. This region provided an ideal site for ethnographic research on health risk perception relating to the oil and gas industry, and I spent two months in the summer of 2004 spending time with and interviewing local residents to learn about their perceptions of environmental and health risks.

Organization of thesis

Following this introductory chapter, Chapter 2 addresses the academic literature I consulted as a foundation to my understanding of the field of risk perception. I illuminate several themes in the literature review that illuminated my approach and analysis. In Chapter 3, I address the process by which I have investigated Fort McMurray residents' perceptions of health and environmental risk. This chapter addresses such methodological concerns as sampling and ethics as well as the interview settings and how I spent my time in the community. Chapter 4 illustrates community context for my research: I provide some details on the history of the town,

from its occupation by Aboriginal groups and fur traders through its industrial development up to its current status as the source of one half of the crude oil consumed in western Canada, the burgeoning population that accompanies this continuing development, and its location far from other urban centers (see Figure 1, p. 37). Following this description of my research setting, I have included two chapters that document the specific risks that my interviewees noted; Chapter 5 specifically introduces perceptions of such risks as cancer, asthma, poor fish health and other concerns in Fort McMurray, and I highlight the material gathered during interviews in this chapter. Discussion and analysis of risks in social and cultural contexts comes in Chapter 6. I approach this chapter from the viewpoint that risks are selected to conform to a particular way of knowing and experiencing the world. Here, I examine risk perceptions and their associated perspectives in relation to existing social science theory and case studies. Finally, I conclude my thesis by summarizing findings and how they relate to academic literature, reflecting on the research process and outlining potential directions for future research.

Chapter 2: Literature Review

In this chapter I present a review of literature relating to the field of health risk perception. Health risk perception is inherently interdisciplinary, bringing together perspectives and approaches from philosophers, sociologists, psychologists, and anthropologists. This literature review, therefore, will reflect the diversity of studies of health risk perception; it will include anthropologists' work where available, and address appropriate studies from other social scientists. Literature reviewed will focus on peer-reviewed articles from scholarly journals, as well as edited books authored by academics, and will primarily address material from the social sciences. My review begins by defining risk, then offers examples of health risk perception studies to provide an overview of the type of work that has already been done. I then move on to theoretical perspectives that will be important in informing an anthropological examination of health risk perception, including attention to the phenomenological perspective and an examination of various approaches to understanding risk perception, most importantly those of Douglas and Wildavsky and Beck. Literature addressing the social and cultural contexts of biomedicine completes the review.

Risk: changing definitions

The term *risk* is used commonly in media and conversation, often enough that we do not generally question its meaning. When undertaking an in-depth study of risk, however, it becomes necessary to circumscribe the word more closely. This section looks at a definition of risk and how its understanding has changed over time.

Risk is a concept addressed in many fields of study, with its origins in economics. This review will focus more on anthropological risk literature, as well as sociological and psychological work. In the seventeenth and eighteenth centuries, *risk* meant the probability of an event occurring, incorporating the magnitude of potential losses or gains (Dake 1992; Douglas 1990). At this point the term was neutral and did not focus on loss as it does today. Risk became a focus of economics in the nineteenth century, with theorists believing that humans were essentially risk averse; anthropologist Mary Douglas (1990) gives the example that business owners in this period would need significant incentive to be induced to invest funds, preferring to hold on to what they had rather than expose themselves to potential loss. In economics, risk was used to indicate a situation in which the probabilities of possible outcomes were known and calculable (Covello and Merkhofer 1993). In contemporary conceptions, risk is cast as the potential for negative consequences only (Covello and Merkhofer 1993; Dake 1992; Douglas 1990; Lupton 1995). Douglas (1990:4) suggests that the term *danger* may be similar in meaning, but is not as politically salient because it is not associated with reasoning and science in the way that *risk* is. Today, risk implies probabilities, calculations and authority, and resonates better with Western industrialized society than terms such as taboo and sin (Douglas 1990).

Risk perception: case studies

This section reviews examples of pertinent health risk perception studies to illustrate the subject matter and theoretical perspectives in this field. Brown's (1987) study of

workers' attitudes to risk found that many either deny workplace risks to avoid stress, or see job benefits as outweighing risks. Fitchen, Heath and Fessenden-Raden (1987) described a community's indifference toward groundwater contaminated by a chemical local factory workers were already exposed to: they were more upset with the inconvenience of having to boil water than the potential for one more case of cancer per million people. A longitudinal study of people living near a petroleum refinery linked symptom reporting with odour perception: as the company reduced odours, residents reported fewer symptoms (Luginaah, Taylor, Elliott & Eyles 2000, 2002a, 2002b). A project in the Canadian north explained Aboriginal considerations of environmental risk in terms of cultural rationality (O'Neil, Elias, Fletcher and Yassi 1998).

These case studies share a common concern for examining risk perceptions in particular contexts, and including ideas about morals, values, place attachment, familiarity and uncertainty. My fieldwork has therefore addressed not simply what risks are perceived and to what degree that is important, but instead has included attention to such contextual information. From these studies I move now to a survey of theoretical perspectives used to inform such research.

Following Douglas and Wildavsky

Mary Douglas and Aaron Wildavsky's 1982 *Risk and Culture* is the most significant piece of anthropologically informed investigation in the risk literature to date. Its goal is to help explain why North America has experienced a "rise of alarm over risk to

life at the same time as health is better than ever before" (1982:15) and applies to the issue a cultural theory of risk that claims to be as applicable to the cattle-herding Hima people of Uganda as it is to the Western world. Their theory posits that risk perceptions are not necessarily based in scientific conclusions and calculations, but are essentially social and cultural: "people select their awareness of certain dangers to conform with a specific way of life" (1982:9). Their thesis reflects anthropology's focus on culture and worldviews as the primary vehicle by which to understand human behaviour. This cultural approach maintains that risk selection is not based on empirical rationality, but is a construction based on morals, values and social institutions: "the perception of risk is a social process" (1982:6).

Following Douglas and Wildavsky (1982) I discuss the following features of risk using supplemental information where appropriate:

1. Risks are selected based on their consistency with a way of life.
2. Risk necessarily implies uncertainty and an inability to fully know threats.
3. The potential reversibility of negative outcomes, and the effects on future generations are considerations in risk perception.
4. Whether a risk is engaged in voluntarily has an impact on risk perceptions.
5. Risk implies not only potential harm, but potential benefits.
6. Risk is moral and political.

Risks are selected

Life is full of small selections that we pay relatively little attention to: is it safe to go outside without a respirator? Will I fall and break a bone on the way to the car? What if the chemicals used for cleaning automobile upholstery cause an allergic reaction? What is my probability of being involved in a motor vehicle accident? People do not pay close attention to all possible risks, weighing them proportionally, but instead focus on a select few. How and why particular risks are selected for concern is the subject of study for social scientists such as Mary Douglas and Aaron Wildavsky. In their cross-cultural study, they consider groups who are "without the benefit of modern science" (1982:29) and link their *pollution beliefs* with modern ideas of pollution, concluding that socially and culturally informed risk selections are made in each system. Their anthropological approach focuses more on people's own understandings of the world than sociological or psychological views that attend to social structure and conflict resolution (ex. Covello 1985; Slovic, Fischhoff and Lichtenstein 1980). Despite their different investigative methods and theoretical bases, all of these authors agree that risks *are* selected, and that in risk selection there is no consensus between different groups, or even among individuals in relatively cohesive groups; people focus on those issues that have the most salience with their beliefs and practices. Presented with field data that suggests people may focus on risks that have been deemed insignificant by scientists and are relatively unconcerned about more probable harms, social scientists' examination remains focused on why people choose to focus on some risks and ignore others: "what needs to be explained

is how people agree to ignore most of the potential dangers that surround them and interact so as to concentrate only on selected aspects" (Douglas & Wildavsky 1982:9).

Covello (1985:5-7) provides a list of considerations in risk selection; these include the potential for catastrophic results, familiarity with the issue, understanding of the risk, uncertainty surrounding possible outcomes, ability to control the risk, voluntariness of exposure, effects on children and future generations, identity of victims, trust in institutions, media attention, accident history, potential benefits, reversibility of negative outcomes, and personal involvement with the risk. He notes that these factors are not necessarily causal or discrete, but interact with each other to influence understandings of risk and can be used to anticipate public responses to new technologies and industrial developments. Covello and Johnson (1987) urge synthesis of psychological approaches with social and cultural research on risk, and some of these factors are studied by both anthropologists and psychologists. Douglas and Wildavsky address uncertainty, voluntariness and reversibility, as well as other social and political factors that can help to account for selections.

Risk and uncertainty

"No person can know more than a fraction of the dangers that abound" (Douglas & Wildavsky 1982: 5) The definitions of risk offered above emphasize that the concept is based on probabilities and possibilities, not certainties. Political scientist Aaron Wildavsky (1988:3) calls risk "the potential for harm," not the certainty of harm.

Uncertainty is a fact of everyday life, and Douglas (1985:42) notes that even the most commonplace choices are "beset with uncertainty." Covello (1985) agrees that when people talk about risk, be it in routine conversations or public debates about impact assessments, they are talking about estimates and potentials, not certainties.

The inability to know the outcomes of events can lead to controversy, confusion and anxiety. Gifford (1986) points out that uncertainty over the degree of risk can lead to controversies within medical fields; in an examination of multiple sclerosis patients, Boieje et. al. (2004) note that the uncertainty of patients' prognoses led to difficulties deciding, for example, whether or not to have children. They also remind us that uncertainty is associated with stress and decreased psychological wellbeing. Similarly, Wakefield and Elliott (2000) show that the uncertainties associated with siting of a landfill were more distressing to some residents than the landfill itself.

Reversibility of risk / Effect on future generations

As we have already learned, some risks are selected as being more significant than others, and there are a variety of factors that influence perceptions of risk. The potential of harms to be reversed or mitigated is one such factor: "risk aversion is sometimes justified by the idea of irreversible damage because the smallest probability of a disaster from which there is no turning back overwhelms all other considerations" (Douglas & Wildavsky 1982:21). Risks that appear to be irreversible can be overwhelming and can compel the risk averse to oppose a particular technology or development. In addition to the apparent irreversibility of a potential

negative outcome as amplifying perceptions of risk, they also note that attention to this one characteristic may mask the potential benefits or safeties of the risk, a point that risk-takers will focus on more than the risk averse. An example from 1865 that Douglas and Wildavasky (1982:23) cite shows how those that have faith in the potential for science to find new solutions can allow actions whose potentially harmful outcomes cannot currently be remediated: a judge ruled that potential damage in 100 years was not adequate basis for an injunction against dumping untreated sewage into a river since scientists would likely have arrived at a solution for the problem by then, representing a particular and political worldview linked to the places of gods, people and nature, among other things. This example brings up the issue of concern for future generations; Covello (1985) notes that possible effects on future generations should be thought of when attempting to understand risk perception. Douglas and Wildavsky (1982) agree that concern about irreversible risks reflects a consideration for subsequent generations, and that scientific uncertainty makes such risk issues more contentious.

Voluntary vs. involuntary risks

To add to issues of uncertainty and reversibility, the voluntariness of exposure to risk is another facet to consider in understanding why certain risks are selected. Douglas and Wildavsky rely on the work of Chauncey Starr to help describe how voluntary risks are generally thought of as more acceptable than those risks that people are subjected to involuntarily. Starr, an engineer, produced one of the earliest articles published on the subject. After a career in nuclear energy research, Starr took an

interest in risk analysis, and published "Social benefit versus technological risk" in *Science* in 1969. His goal was to establish a methodology for determining the social acceptance of risk using quantitative measures. The work revealed that the public is willing to accept voluntary risks that are a thousand times greater than involuntary risks. Involuntary risks are selected as more significant because individuals cannot control their exposure to them, whereas the risks from rock climbing are assumed to be understood and accepted by the climbers, and any responsibility lies with them. A personal choice that does not put others in harm's way is much more acceptable than the risk of a nearby industrial plant exploding and exposing neighbours to potentially harmful chemicals. Douglas and Wildavsky (1982:17) support Starr's idea that people's "sense of outrage at involuntary risks will naturally grow more intense;" risks are always political events. They warn, though, that the distinction between voluntary and involuntary risks can be hazy, that voluntariness of exposure could be interpreted widely, and is particular to a time and place. They consider that the rock climber's activities can require others to risk themselves to rescue him should he need it, that even seemingly benign voluntary risks "are likely to spread danger" (1982:20). A bar patron chooses to smoke; does a bartender choose to breathe at work? He makes a choice to go to work, but perhaps has few other options: is his exposure to second-hand smoke voluntary or involuntary? There is certainly more going on here than a simple binary distinction; as Covello (1985) notes, factors in risk selection are not isolated from each other. We must also consider the potential benefits of a risky situation.

Potential benefits from risk

The uncertain nature of risk implies that there are possible harms, but also potential benefits; "risk is also opportunity" (Douglas & Wildavsky 1982: 22). Douglas and Wildavsky (1982:18) suggest that "a person might prefer to risk an industrial accident, or accept a certain degree of pollution, to being unemployed." The bartender may select cigarette smoke as a risk to be lived with rather than outraged over in exchange for wages and tips. Starr (1969) also brings up the idea that risks can be compensated for, that people can focus on the benefits rather than the dangers. He found that miners were more willing to accept individual risks associated with the job when their wages were increased. Starr's findings were corroborated by a study of workers' attitudes to risks in their jobs; Brown (1987) also found that risks were more accepted when job benefits were better, and that greater risks will be tolerated in conditions of fewer employment opportunities. Such information is certainly appropriate to have in hand when studying the Alberta oilsands, where workers are often exposed to chemicals, but have some of the highest incomes for tradespeople in Canada.

Scientists disagree

Risk and Culture devotes a chapter to examining disagreements between experts and suggesting reasons for such dispute. The authors suggest that with the technology available to researchers today, we are left with more questions than answers: "science has actually expanded the universe about which we cannot speak with confidence"

(Douglas & Wildavsky 1982:49). Risk perception is a social process, and scientists are as much a part and product of their social and cultural surroundings and history as anyone else; though they may try to dissociate their conclusions from values and morals, claiming that they are wholly objective, scientists become passionate about issues just as laypeople do. Levels of chemicals in the atmosphere are scientifically knowable, and yet "scientists disagree on whether there are problems, what solution to propose, and if intervention will make things better or worse" (Douglas & Wildavsky 1982:63). Controversy is unavoidable even in an environment of supposed objectivity. Establishing acceptable levels of risk is about more than objective facts, it moves "from correct answers to agreed conclusions" (Douglas & Wildavsky 1982:66). In doing so the issue under contention becomes one in which morals and values must be considered; this task falls to the lawmakers charged with protecting citizens, and risk thereby becomes not simply a mathematic or scientific disagreement, but a moral and political phenomenon.

Risk is moral and political

A study of young Hispanic farm workers in the US also showed how risks can be tolerated in exchange for job opportunities, and found that youth were willing to expose themselves to pesticides they knew to be harmful in order to help their families (Salazar, Napolitano, Scherer & McCauley 2004). We can see in this example of exposing oneself to risk for the good of others how people are explicitly moral when discussing their perceptions of and actions regarding risk. As Douglas and Wildavsky (1982:73) note: "The ordinary individual admits that his loyalties and

moral obligations are largely the matter at stake." Their judgments are based on values and morals, rather than the scientific conclusions that experts assume to be objective; people "do not make the rational calculations that they are expected to make" (Douglas & Wildavsky 1982:74). Geographers Baxter, Eyles and Elliott (1999) suggest that the rationality of lay people differs from the rationality of experts. Laypeople do not make decisions based solely on what numbers and graphs suggest they should do, but based on their various moral commitments and their views of how life should be. O'Neil et al. (1998) assert that risk selection is based on a cultural rationality. This manner of decision making contrasts with that of the scientist, who "claims to depoliticize an inherently political problem" (Douglas & Wildavsky 1982:73). Douglas and Wildavsky argue vehemently against the idea that risks should or could be understood apart from their political and moral contexts: "it is a travesty of rational thought to pretend that it is best to take value-free decisions in matters of life and death" (1982:73). When people consider the wellbeing of their families, they cannot be expected to think only of the calculations of scientists and experts; social scientists must attempt to understand the values at stake, how the risk choices fit into the moral and political world in question. Risk becomes a contentious issue when there is no consensus on social/cultural goals and values (Douglas & Wildavsky 1982). Disagreements about risk are based in different goals for how we live in the world (Dake 1992), and such contention is inevitably political. Noting that risk controversies relate to struggles for political interests and control, Wildavsky and Dake (1990) suggest that political biases are an indicator of risk perceptions, second only to cultural biases. Hesitant knowledge about risk and differing values and morals

lead to difficult political situations, and risk must be politically negotiated (Dake 1992). Uncertain knowledge and contested consent characterize "the contemporary dilemma of risk assessment" (Douglas & Wildavsky 1982:6). It is up to governing bodies to set regulations for acceptable levels of economic, social, environmental and health risk, whether their consequences are known with certainty or not. Governments must consider the opinions of experts (who themselves cannot always agree) along with the values and concerns of their constituents to create legislation that satisfies as many parties as possible; certainly decisions will not please all stakeholders, especially in an age in which risks are becoming more than just local concerns, but are distributed globally.

Critiques of *Risk and Culture*

Beck (1999) is critical of Douglas and Wildavsky (1982) for being too constructivist in their cultural analysis of risk, and accuses them of ignoring the material aspects of risk. Covello and Johnson (1987:viii) also mentioned this: "According to this view, risk is not an objective reality." In a 1990 article, Mary Douglas responds to such critiques, saying that she did not mean to suggest that dangers were not real, simply that she was discussing how dangers are politicized, not considering their reality. Beck disagrees with Douglas and Wildavsky in regard to their comparison of modern and pre-modern risks: "we know that people in the Stone Age did not have the capacity for nuclear and ecological annihilation, and that the dangers posed by lurking demons did not have the same political dynamic as the man-made hazards of

ecological self-destruction" (Beck 1999:23). The *risk society* concept maintains that the risks of today are different from those of other ages.

Ulrich Beck and *risk society*

Beck is a German sociologist who writes on reflexive modernization, individualization, but most importantly for this study, a model he calls *risk society*. He has addressed this concept in many publications, beginning with a 1987 article in the Berkeley Journal of Sociology, and the first prominent work being *Risk Society*, published in English in 1992. Here I address the basic points of risk society to identify useful concepts for understanding risk perception.

Risks are not distributed equally: "pollution follows the poor" (Beck 1999:5). While smog may be democratic (Beck 1992:36), it is still the poor who are put at greatest risk from the dangers of risk society.

> Poverty attracts an unfortunate abundance of risks ... The risk of becoming unemployed is considerably higher for unskilled than skilled workers. Risks from stress, radiation and toxic chemicals that are connected to working in the corresponding industrial plants are unevenly distributed among specific occupations. It is especially the cheaper residential areas for low-income groups near centers of industrial production that are permanently exposed to various pollutants in the air, the water and the soil. A higher tolerance can be obtained with the threat of a loss of income (Beck 1992:35).

Risk society's view of unequally distributed risks meshes well with Douglas and Wildavsky's (1982) assertion that risks are tolerated by those facing unemployment, or when, as with Starr's (1969) miners, wages seem worth the potential risks.

Globalization has brought risks out of their local contexts and into a global environment (Beck 1992). Industrialization has led to pollutants that spread worldwide, to effects that reach far beyond the regions of those that create them. The world risk society is one in which national-level risks have given way to risks that extend beyond the geographic and political boundaries of any particular country (Beck 1999). Just as the geographic focus is different in the risk society, so is the temporal preoccupation. The risk society does not base its present on its past, but on projections of the future (Beck 1996; 1999). Present action is focused on things that have not yet happened; "we are discussing and arguing about something which is *not* the case, but *could* happen if we continue to steer the same course as we have been. Believed risks are the whip used to keep the present day moving along at a gallop" (Beck 1999:137).

Like Douglas and Wildavsky (1982), the risk society model maintains that experts do not agree amongst themselves (Beck 1987). Science is uncertain, has criticisms from within, and can offer only probable security (Beck 1987). Disasters such as Chernobyl cause people to distrust experts and industry; this characteristic of risk society reminds us of Covello's (1985) assertion that levels of trust in institutions can be used to help predict public perceptions of technological risk. Responsibility for risks lies with the capitalist, industrial companies that create them (Beck 1987). Individuals are put in a difficult position in the risk society, in that they do not trust their scientific experts as previously, but yet must rely on their technologies to know about industrial risks (Beck 1987). The risks of the new modernity are not accessible

to the unaided human senses; gases are odourless, invisible, leaving senses disempowered (Beck 1987). Canadian geographers have, however, conducted studies that showed that perceptions of risks from a petroleum refinery were related to odour perceptions (Luginaah et al. 2000, 2002a, 2002b). I offer, then, that *some* risks of modernity are undetectable, but certainly not all of them.

Risks are real in a different way than previously: they still have a material reality, but it is one that cannot be known by laypeople, and requires interpretation from experts and machines. As anthropologists are aware, even statements that claim to be objective and based on scientifically knowable fact reflect some sort of cultural bias; Beck maintains that risk statements "are neither only factual or only value statements. Instead, they are either both at the same time or something in between, a 'mathematicized morality' as it were" (Beck 1999:138). Beck recognizes "that there is at the same time the immateriality of mediated and contested definitions of risk *and* the materiality of risk as manufactured by experts and industries world-wide" (1999:4). He claims to be neither a constructionist nor a realist, but uses each perspective as it fits (Beck 1999).

Critiques of Beck's risk society suggest that it does not have enough basis in empirical investigation and is too abstract in its theorizing (Wilkinson 2001). Concerns have also been raised that Beck is unaware of research on media and communication, underestimates people's ambivalence toward risk, and presents an overly simplistic dichotomy between 'expert' and 'lay' opinions (Wilkinson 2001).

The significance of Beck's theory lies in the ideas that experts disagree, are not trusted but have access to the specialized equipment necessary to know the risks of industrialization, that risk statements are value statements as well as factual statements, that experts and laypeople disagree with each other, and that uncertainty is pervasive. These observations, combined with Douglas and Wildavsky's assertion that perception of risk is based in the culture and worldview of the individual, provide fertile ground for undertaking fieldwork on risk by helping to describe a general social backdrop.

Phenomenology and perception

Most of the risk literature deals with risk as political and social phenomenon; relatively little work has focused on the perception side of the equation. Phenomenological contributions help to ground health risk perception in experience. As with any theoretical basis, there are differences amongst various writers' conceptions of phenomenology, however this survey does not allow for lengthy analysis of the history and development of the variations of phenomenological theory and its writers. Such summaries are available should the reader require more detailed information (see, for example, Marion 1998; Mohanty 1997; Sajamo and Kamppinen 1987; Spiegelberg and Schuhmann 1983; Stapleton 1983). This review instead focuses on describing the facets of phenomenological thought relevant to the project at hand: it reviews how people are constantly engaged in their world both physically and mentally, and examines phenomenology's views of perception and how people

understand their worlds. This material will contribute to the overall discussion of risk, perception and subsequent action by people.

Phenomenology is a theory and a methodology that attempts to understand human experiences of being-in-the-world through consideration of a synthesis of physical and mental realities (Heidegger 1988). Rather than seeing human experience as divided into categories of objective biological realities and subjective cultural and social constructions tagged onto the corporeal world, phenomenology posits that humans are always *in-the-world*, that physical encounters and mental reflections upon them occur in tandem. It does not deny the reality of the physical world or position humans in a state of contemplative detachment from the world: "life is given in engagement, not in disengagement" (Ingold 1992:44). Far from taking a constructivist stance, phenomenology seeks to understand the experience of the agent-in-its-environment, rather than a "self-contained individual confronting a world 'out there'" (Ingold 1995:58). A prominent French philosopher and student of Husserl, the 'father of phenomenology,' Merleau-Ponty emphasizes that 'the world is there before any possible analysis of mine' (1962:x), that it is pointless to attribute experience solely to the creations of the human mind; "the world is not what I think, but what I live through" (Merleau-Ponty 1962:xvi-xvii). While experience is not determined by individual consciousness alone, the world is lived through a personal context, influenced by one's own practical involvement with the world. Philosopher Eric Matthews states that "the things and relationships in [my world] get their meaning for me through their relationship to my purposes, activities and needs" (Matthews

2002:33). People know their world through their engagement with it; even facts and perspectives that are assumed to be objective are known through a particular context. Scientific knowledge is no exception: "I cannot shut myself up within the realm of science. All my knowledge of the world, even my scientific knowledge, is gained from my own particular point of view, or from some experience of the world without which the symbols of science would be meaningless" (Merleau-Ponty 1962:viii). Merleau-Ponty believed that "objective thought fundamentally distorts the phenomena of our lived experience, thereby estranging us from our selves, the world in which we live and other people with whom we interact" (Langer 1989:49). Phenomenology sees so-called objective truths as experiences subject to immediate personal reflection and influenced by memory and expectation just as any other aspects of the world. Each knowable fact will be understood differently by different individuals, and phenomenology tries to learn about these perceptions within the context of particular individuals' and groups' ways of being-in-the-world.

It is here that phenomenology can be applied as a method; to understand how it is that people understand and perceive their world, we must learn about their practical involvement with it. "The real has to be described," says Merleau-Ponty (1962:x). The goal of phenomenologically-oriented studies is "to give a direct description of our experience as it is" (Merleau-Ponty 1962:vii). Merleau-Ponty saw phenomenology as providing a means by which to describe "the way in which meaning emerges in the world from the interaction between human subjects and the objects of their experience" (Matthews 2002:56). To create such a description,

phenomenology focuses on the qualitative understandings of the individual, rather than any sort of neurological examination of how physical phenomena are translated to the brain. Matthews provides a concise description of the goal of phenomenological investigation:

> "A phenomenology of perception ... would set aside all questions about how we causally explain perception as an objective physiological phenomenon, and start from our own subjective experience of being perceivers; it would describe that experience, although in a way that increased our understanding of what it means to us to 'perceive a world'" (Matthews 2002:47).

Anthropology is a domain well suited for such phenomenological investigation because it relies on participation with the people in question, and is explicitly concerned with people's practical and everyday engagements with the world. The researcher attempts to be practically engaged in the lives of the individuals and groups being studied, and thereby can achieve some understanding of the everyday involvements, the being-in-the-world, of those people. The researcher not only plays a part in activities, but discusses them with participants, engages in conversations about what the activities mean, how the participants think about their actions and more broadly, the world in which these actions are situated. Phenomenology thus provides a way in which the anthropologist can begin to understand the perceptions of the people being studied.

Perception is a primary concern of phenomenology. Perception is seen as a continuous and spontaneous process; humans do contemplate issues, realities, experiences, but do not exist in a world of 'contemplative detachment' (Ingold 1992). According to phenomenology, perception is based in our practical involvement with

the world: "we do not ordinarily just see or hear or otherwise perceive things for perception's sake, but rather we perceive as part of the activities in which we find ourselves engrossed" (Wrathall 1998:184). These engagements with the world interact immediately with memory and previous experience to result in a perception that makes sense to our own individual histories and current situations (Hussserl 1999). These perceptions occur immediately upon presentation of new information; because we are in-the-world and are continually, practically involved with it, we must react to it immediately—perception and action are inseparable (Ingold 1992). In the phenomenological study of human experience and consciousness, the focus is not so much consciousness but consciousness-of, not perceptions themselves but the acts of perceiving that are thought to characterize consciousness (Tibbetts 1969:236). For Merleau-Ponty, consciousness is embodied and emplaced: "the subject that I am ... is inseparable from this body and this world" (1962:408). As the scope of this literature review does not allow for in-depth investigation of the nature of human consciousness, it is perhaps best to conclude this examination of phenomenology and perception by summarizing that of most importance to this study will be the notion that when encountering new experiences, we immediately apply memories from the past to the new situation; perception, therefore, is a continuous process involving instant synthesis of past experiences and immediate reflection on new information.

With such information in mind, my fieldwork reflects phenomenology's focus on understanding the ways in which meaning results from practical involvement with the world. I attempted to become involved in daily activities of residents in an effort to

better understand how the residents of Fort McMurray are in-the-world. While it was not expected that fieldwork would include any actual tasks in the extraction sites or processing plants, opportunities existed to engage in more public forums such as the local Friendship Centre, as well as experiencing such commonplace activities as grocery shopping, transportation and recreation. Living in the community for the summer also helped to establish familiarity with the setting and context in which perceptions of health and environment are created, and enabled me to better understand what residents attempt to communicate.

Health and Biomedicine

Since my research investigates perceptions of health risk, my literature review concludes with some attention to scholarly writing on health. As in most of North America, biomedicine is the dominant medical system in Fort McMurray. Homeopathy, acupuncture, reiki, herbal supplements, spiritual healing and the like are not common options in this industrial town. I have therefore elected to focus on biomedicine in this brief review of social science literature on health and its conceptualisation in the West. As the goal of the project is to examine perceptions of health *risk* rather than health itself, I here present a brief account of health as it is conceptualized in biomedicine.

Biomedicine is "the biologically oriented medicine that predominates in Western societies" (Hahn 1995:1). It sees disease not as a spiritual or supernatural process, but a physical problem that prevents the proper functioning of a part of the body; "disease

is located in the body as a physical object or physiological state" (Good 1994:116). Disease has biological origins and discoverable cures; science has the potential to know exactly how disease originates and how to cure it, given enough time, manpower and funding to do the appropriate experiments. Gifford (1986) notes that the concept of risk is physically located in the body of the patient. Having breasts or a prostrate can be dangerous, as these are common sites of risk for cancer. In order to avoid the probability or even possibility of cancers detected through genetic testing, biomedical doctors will sometimes remove a lump-free breast, thereby excising risk (Lock 1998). Responsibility for the maintenance of good health rests with individuals (Beck-Gernsheim 2000). Epidemiologist Beverly Rockhill (2001) notes that individuals may be blamed for lifestyles that foster illnesses; for example, they may spend too much time sitting down instead of engaging in physical activity, they may eat foods with too much salt, they may work at jobs that induce stress, or they may not take prescribed medications properly. Individuals may be blamed for not protecting themselves appropriately from viruses and contracting HIV (Lupton 1995). Good health is a personal project, a task requiring great vigilance. Boeije, Cecile and Janssens (2004) show that when biomedical authority is inadequate, patients envision their futures based on their previous illness experiences: when faced with an information void, patients relied on the authority of their own experiences, rather than live with uncertainty.

While this survey of social science literature on health and biomedicine is certainly not exhaustive, it is sufficient for an understanding of the medical context in Fort

McMurray. Most respondents can be expected to conceive of illness as a physical malady that may have resulted through some fault of their own; certainly, it is the sufferer's responsibility to seek aid and follow doctors' proscriptions. Residents may express frustration at not having access to exact etiologies for their problems, and such frustration might reflect a greater distrust of institutions' authority. The concept of health is fluid and amorphous; my interview material shows that people use the term 'health' to refer to a broad spectrum of social, environmental and bodily states.

Summary

I have attempted to provide an overview of literature relevant to conducting research on health risk perceptions in Alberta's oil sands. Literature on health and biomedicine has yielded information that suggests residents may be expected to discuss their health in the context of a biomedical system that places responsibilities for physical wellbeing on patients themselves, a system that relies on scientific understandings that claim objectivity but result in uncertainty and a lack of trust. Beck's risk society concept draws attention to industry as liable for pollution and associated health and environmental risks, and suggests that in this second modernity we do not trust in experts because science cannot agree within itself. He notes the importance of power and politics in the negotiation of risk; Douglas and Wildavsky, too, emphasize that risk and the way it is discussed and presented is political. When decisions about public safety have to be made, political officials are left to make conclusions about what may be deemed an acceptable level of risk, what is excessive or dangerous, and there are always multiple interests at stake. Douglas and Wildavsky also note that risk

is moral and value-laden, that only particular risks that make sense to a group are selected for concern while others are ignored or marginalized, and that people consider such things as the reversibility of a risk and its effect on future generations, whether or not a risk is voluntary and what kind of benefits may be obtained through engagement in risky actions or behaviours. Like Beck, they note that uncertainty is inherent in risk; the future cannot be foretold, and so we must make the best decisions we can with incomplete knowledge. Phenomenological theory focuses on how people experience their worlds; like the risk researchers, phenomenologists emphasize that we must pay attention to context. All perceptions are experienced in a particular time and place, by a particular body with a particular worldview and history; we must pay attention to the whole being in it its whole world in order to get closer to understanding its perceptions. Studies that have been done by health risk perception researchers provide support for this idea; the studies presented here conclude that people consider more than just abstract scientific information when making decisions about risk. Their perceptions are influenced by their attachment to the place in which risk is present, by factors such as gender and power differentials, morality, values and aesthetics.

When investigating health risk perception, we must consider more than just the answer to the question "what is risky?" We need to focus on the interactions between the geographical context, the cultural context, personal histories, worldviews of groups, community structures, attitudes toward science, biomedicine, industry and authority. My fieldwork has attempted to reflect these concerns, and these issues will

be revisited and commented upon in Chapter 6, where I discuss data and observations from fieldwork.

Chapter 3: Process

This section will address methodological processes and other considerations involved in my fieldwork and data analysis. With the goal in mind of a Master's thesis attempting a qualitative understanding of health risk perceptions in Fort McMurray, I selected the traditional anthropological methods of participant observation and informal interviews for my fieldwork. Taking under advisement that "such research cannot be programmed, that its practice is replete with the unexpected" (Hammersley and Atkinson 1995:23), I made loose plans that allowed for flexibility and reflexivity. I created a list of issues that I wanted to address and potential ways in which to do so, but left room for any appropriate changes in the research focus that might arise. Although research is always limited by time and funding, I endeavored to make the best of my available resources and take advantage of what learning opportunities I could while participating in and observing the experience of living in Fort McMurray.

Participant observation is generally accepted as the crucial methodology that informs anthropological ethnography. This method "involves the ethnographer participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions—in fact, collecting whatever data are available to throw light on the issues" (Hammersley and Atkinson, 1995:1). The researcher usually spends a significant amount of time in the geographical location under consideration, and attempts to become involved in daily activities and special events, a participant with a mind to observation. In comparison with survey-style research common to other social sciences, participant observation is a method

that is oriented toward a more holistic and less structured understanding of the setting, actors and issues under investigation by enabling the researcher to become more involved and more accepted in the community, thereby facilitating better access to information.

For this project, participant observation took the form of living for two months in the summer of 2004 in a 'camp' just outside of Fort McMurray, and spending much of my time at the Nistawoyou Association Friendship Centre (NAFC). Living in one of about forty 10' by 10' rooms in Trailer 1 of a three trailer complex fifteen minutes' drive east of town, I was able to observe and participate in some elements of the lifestyles of those who come to north eastern Alberta seeking work. Interacting with other temporary residents in the hallway, communal kitchen and decks, this living arrangement allowed me access to some of the workers' views in a (usually) relaxed atmosphere. I chose not to conduct any formal interviews with my neighbours, instead letting our conversations allow me to learn casually about their views on health, environment, work, and being in Fort McMurray.

During the day, I often visited the Nistawoyou Association Friendship Centre. The name 'Nistawoyou' is from the Cree name for Fort McMurray, meaning "the place where three rivers meet." The NAFC operated a drop-in program where the public could obtain pamphlets and information about employment, community services, and Aboriginal-specific programs, they could browse through the free collection of donated clothing, toys and furniture, or just converse and have coffee and any snacks

brought in by volunteers or guests. At the time, the NAFC was run by one paid employee who was at the centre Monday through Friday to answer phones, speak with guests, help to organize the donation centre, make coffee and basically oversee the daily operations. The NAFC was governed by a board of volunteers who secured funding, decided on programming and made other administrative decisions. Patrons were primarily Aboriginal people who lived in Fort McMurray, Fort Mackay, Fort Chipewyan or other outlying communities. They ranged from homeless people who would stop by during their daily bottle collections, or en route from a local soup kitchen, to Elders and activists, or just people looking for conversation and company. While there I helped staff and volunteers with various tasks, including facility cleanup and preparations for Canada's National Aboriginal Day celebrations at the Centre, and was able to witness and be involved in conversations on a wide variety of topics, including health, employment, addiction and politics. My participation in everyday activities at the NAFC not only afforded me a more holistic understanding of the setting and actors in my field location, but as I become a more familiar face visitors granted me more access to their opinions and perceptions. Basso allows that "...in going about one's fieldwork, it is always permissible--and sometimes highly informative--to smile and even to laugh" (1996:58). I was happy to take advantage of this advice and quite enjoyed my days at the NAFC.

Hammersley and Atkinson (1995:53) note that "not all the people we wish to observe or talk to, nor all the contexts we wish to sample, may be accessible – certainly not at the times we want them to be." My field experiences proved their statement to be

true, although I made efforts to arrange my schedule around those of my interviewees. Some interviews took place at the NAFC in the middle of the day when visitors were available for conversation. Other meetings were arranged with people at their workplaces, either during a break or while they were unoccupied; some accommodated awkward shift times. Despite my flexibility, many residents who expressed interest in the project were unable to find a free hour between work and social obligations.

The locations I chose for interviews were based on the convenience for the respondents, and for my own safety. My neighbours at camp suggested I choose public places for meeting with people with whom I was not familiar; as others at home had done, they warned that as a lone female in an industrial town, I was likely to encounter some 'unsavory' individuals. I heeded their advice and met with interviewees in restaurants and coffee shops; the people I met were all very friendly and appeared non-threatening, but I felt it best to follow the advice of those who had been in the community longer than myself. Other locales included workplaces, as previously mentioned, because this situation was most convenient for the interviewee. I interviewed guests, staff and volunteers of the NAFC in situ; for staff and volunteers, it was easiest for them to speak with me during down time in the middle of the day, and for guests it was a comfortable venue in which to converse. Some Aboriginal residents expressed that they were uncomfortable in many public places in town because they were discriminated against by shop owners, staff and security personnel, so a public gathering place that was designed with the needs and comfort

of Aboriginal residents in mind was ideal. Another interview venue chosen for the ease of the respondents was a local union hall; I arranged with union officials to interview members during one of their general meetings, and the office provided me with a private room in which to do so. Union members knew that the project had the support of officials, and they could feel free to speak their minds without fear of being overheard by co-workers and supervisors.

Interviews were loosely structured and reflexive to allow "the discussion to flow in a way that seems natural" (Hammersley and Atkinson 1995:152). My goal was to discover what the residents felt was important about health and environment and what risks were associated, so rather than asking very directed questions on specific issues, I kept my queries general and allowed the interviewees to bring up their own particular concerns and opinions. I did not ask the same questions in each interview, nor did I have a list of specific question to ask; rather, I knew what concepts I hoped to address, and brought them up as befitted the conversation. I did, however, attempt to focus the participants on ideas that were particular to Fort McMurray; I was not attempting to learn about risk perceptions in general, but about those risks perceived specifically in and about Fort McMurray. Remaining aware of the idea that "it is still the case that no one lives in the world in general" (Geertz 1996:262), I asked questions such as: is it risky to live here? What are some of the environmental health risks that you see in Fort McMurray? In this way I was able to access views related specifically to my research interests and situate perceptions in their contexts. I did not offer interviewees definitions of risk or health, but rather sought their understandings;

Arquette et al maintain that researchers need to acknowledge that conceptual categories "are culturally based and community specific" (2002:262). The freedom this approach afforded interviewees provided me with a breadth of information that would not have been possible with a narrowly focused line of questioning. I conducted 18 of these semi-structured interviews.

I chose to record the audio from interviews, which ranged from ten minutes to two hours, on mini-disc to allow for more involved conversation and more in-depth analysis at a later time. Without having to take detailed notes, I was able to pay attention to the conversations, and the interviews did not have the clinical feel that can result from note-taking. I did occasionally make brief notes during interviews, but only as a reminder of an issue to redress later in the conversation rather than something to rely on for analysis. Permanent recordings can enable the researcher to obtain more comprehensive information than notes; for example, an important point may be missed when writing rapidly, or some nuances in tone can be recorded and provide the researcher with insights that notes cannot (Hammersley and Atkinson 1995). In my case, audio was significantly more useful than notes due to my atrocious handwriting. Prior to commencing the interview, all interviewees were informed that conversations would be recorded, and were given the option to decline taping. Typed transcriptions of the interviews were completed following the field season and were not available to anyone but myself.

Effort was made to include the views of Aboriginal residents through my reliance on

snowball and opportunistic sampling methods. By interviewing people that I encountered during my daily life in town and at the NAFC, my interviews represented a variety of residents: at the NAFC I spoke with a number of Aboriginal respondents, plant workers, a political figure and activist, the unemployed, and also some homeless people who would have otherwise been difficult to access. In an effort to broaden my sample, I put up a poster at the Keyano College requesting interviewees, and thereby met a few students. Oil sands plant workers were further represented in the individuals interviewed at the union. Overall, my sample included a wide spectrum of Fort McMurray residents despite the limits on my time in the community. This sample likely over-represents the more disadvantaged classes in Fort McMurray; I felt it a valuable undertaking to learn about those individuals who often have fewer opportunities to express their concerns.

When interviewing Aboriginal people, it is customary to offer honoraria as a show of respect for the privilege of accessing information. In keeping with this convention, my funding allowed for small offerings of cash or other gifts to demonstrate my gratitude for the knowledge I received from participants. I applied this honorarium to Aboriginal persons and those that seemed in need of some small assistance. While funding did not allow for every participant to be compensated for their time and sharing, all others were thanked with words that were just as gratefully given.

Keeping in mind that ethnography "carries quite serious intellectual and moral responsibilities" (Van Maanen 1988:1), I addressed research ethics in the form of an

Ethics Statement approved by the University of Alberta. It included consideration of such concepts as respect for human dignity, respect for free and informed consent, respect for vulnerable persons, respect for privacy and confidentiality, respect for justice and inclusiveness, minimizing harm and maximizing benefit for respondents. This Statement was approved prior to commencing fieldwork, and was available for respondents to peruse. All interviewees were informed about the project and the voluntary nature of their involvement, and signed consent forms agreeing to participate. They were aware that the interviews would be recorded and that they could choose to remain anonymous; most, however, were not concerned with anonymity and gave permission for their names to be used in any papers or presentations resulting from the research. Nonetheless, in the interest of maintaining interviewee privacy, I have elected to identify speakers by their initials rather than their names; the reader's understanding of the text will not be affected, and initials will still allow any participants who read this or other materials resulting from this research to identify their contributions.

Analysis of results involved many readings of the interview transcripts. Based on recurring themes in discussions, I developed conceptual categories of perceived risks, presented in Chapter 5, and more general contextual issues such as place attachment, attitude toward industry and ideas about change that are investigated in Chapter 6. These categories are by no means exclusive of each other, but are interrelated; I have created them out of convenience for discussion and relation to literature.

Chapter 4: Context

Fort McMurray is an industrial city in the boreal forest of northeastern Alberta, Canada, located at the confluence of the Athabasca and Clearwater Rivers 439 kilometres north of the provincial capital of Edmonton. Fort McMurray is located in the boreal forest, on hilly terrain prone to flooding in the flats. Commercial agriculture has not been important here because of the short growing season at its latitude. The origins of the city lie in the fur trade and, subsequently, industrial development. Since large-scale exploitation of the Athabasca oil sands that lie beneath the region began in the 1960s, the city has grown substantially, from a town of about 3000 then, to a city of 60,983 (Regional Municipality of Wood Buffalo 2005:6). The economy remains based on the extraction and processing of bitumen from the largest oil sands deposit in the world. Three plants operated by different companies (Syncrude, Suncor and Albian Sands) are located about 20 kilometres north of Fort McMurray on its only highway. Over half of the employed population work either for the plants or for their subcontractors; another significant portion of the employees are involved in construction to support the rapidly expanding population (Regional Municipality of Wood Buffalo 2005). People move from all over Canada – particularly from Newfoundland – and the world in search of high paying jobs; many will find them, but will also discover that the cost of living in an isolated industrial community can be a major financial concern. Revenue from the oil sands is a major factor in economic surpluses that the province of Alberta reports yearly, and fuels what the provincial government calls "The Alberta Advantage:" business-friendly legislation, low tax rates, economic opportunity, efficient infrastructure and a high

standard of living. This section will provide some information regarding the region's history and its current characteristics.

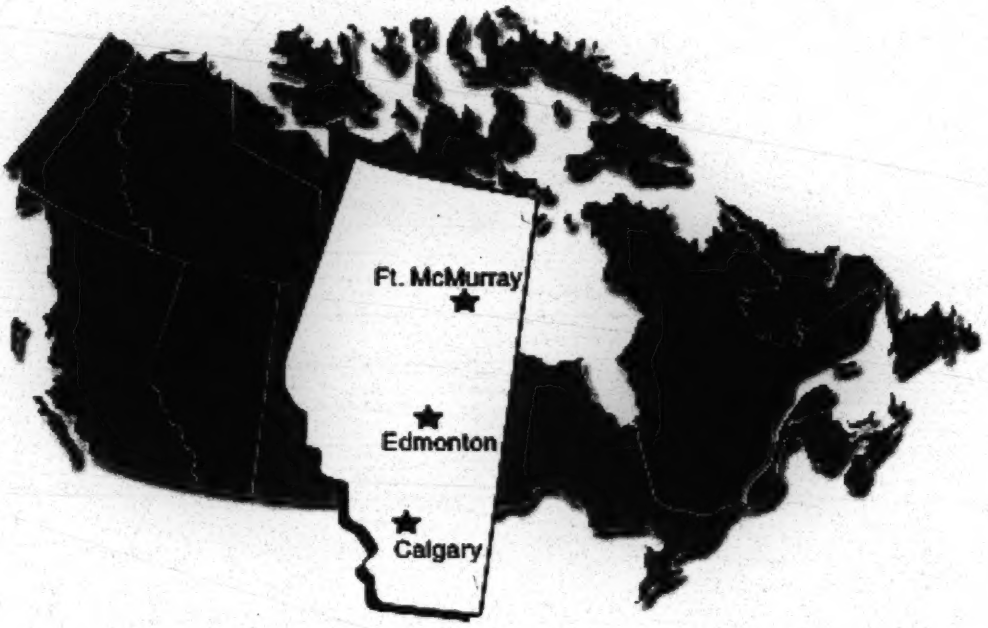

Figure 1: Map of Alberta, Canada

Local Aboriginal history

I do not intend to provide an exhaustive review of the history of Fort McMurray and the Athabasca tar sands, but rather an account of more contemporary issues. In the most recent census of the Wood Buffalo region, 10.3% of females and 8.7% of males in Fort McMurray indicated they were of Aboriginal heritage (Regional Municipality of Wood Buffalo 2005:17). Before the rise to prominence of industry, the situation was much different; for thousands of years, Aboriginals were the only human inhabitants of northeastern Alberta. Archaeological research shows use and occupation of the Wood Buffalo region of Alberta for about ten thousand years

(Huberman 2001). Evidence has been found of camping, tool manufacture, and hunting of various animals including bear, beaver, wolf, elk, deer, bison, caribou and moose. The specific location of Fort McMurray was not continuously occupied; it has been suggested that the area where the Athabasca, Clearwater and Horse Rivers meet was used by Aboriginal groups for its resources, but was not a place to stay for long periods of time (Caldwell, Zwerman and Olmsted 1979). The Dene used the region occasionally beginning about five thousand years ago, with evidence showing increased usage from three thousand years ago (Huberman 2001). The Woodland Cree moved north into the region as a result of the fur trade, and by the late 1700s claimed the land around Lake Athabasca that had previously been occupied by the Chipewyan; a peace agreement between the two groups was reached in 1790 (Huberman 2001). From this period, much of the Aboriginal history was intertwined between a traditional lifestyle of hunting and gathering for subsistence and the new economy of the fur trade; European explorers and traders were present in the region from 1778. Aboriginal groups in the Athabasca region signed Treaty 8 in 1899; the treaty promised hunting and fishing rights, policing, education, medical assistance, retention of mineral and water rights and $5 per year per person. Since then, many Aboriginal people have been unsatisfied with the manner in which the Crown has acted on the agreement, concerns about unemployment, poverty and the ability to maintain a traditional lifestyle being central concerns. The case of northeastern Alberta is not radically different from that of other Canadian regions: local Aboriginal people suffered from smallpox epidemics, were introduced to alcohol by traders, and entered into a treaty that many people today regard as unfair. This description of the

local Aboriginal history is not detailed or by any means complete; the reader may seek out historical accounts for more information (see, for example, Garvin 1992; Fumoleau 2004; Hoffman-Mercredi 2002). This overview sets the current situation of Aboriginal peoples in this area into a historical context. Prominent contemporary issues include racism and employment in the oil sands industry, and will be addressed throughout the rest of this chapter.

Fur trade and development

As in most of the Canadian west and north, contact between Europeans and Aboriginal groups around Fort McMurray occurred through the fur trade, which was dominant in northeastern Alberta from the late eighteenth century until the 1950s (Parker and Tingley 1980). Before European explorers and traders reached the Athabasca region, Woodland Cree were moving north in search of furs to trade (Huberman 2001). They were followed in 1778 by the first European to visit the area, Peter Pond. At that point unaffiliated with any particular company, Pond has been described as "a semi-literate, ruthless Yankee fur trader" who had moved north to seek his fortune; he was later implicated in the deaths of two co-workers (Ferguson 1985). Later a member of the North West Company, Pond established a fort thirty-eight miles south of Lake Athabasca on the Elk River, and traded with both the Cree and the Chipewyan (Huberman 2001). Competition between the North West Company and the Hudson's Bay Company increased, and eventually both these and the XY Company were represented in the region, each trying to obtain better and finer furs from local hunters and trappers. Succeeding Pond in the Athabasca, North

West Company trader Sir Alexander Mackenzie established Fort Chipewyan in 1788 on the shores of Lake Athabasca, up the Athabasca River from where Fort McMurray (then called 'the forks') would be (Huberman 2001). Fort McMurray itself was named for William McMurray, Chief Trader with the HBC, who had ordered Henry "John" Moberly to establish a fort at the forks in 1870 (Huberman 2001). For many decades subsequent, Fort McMurray would remain a stopping point on the way north, a post and an outlet rather than a community or home to people.

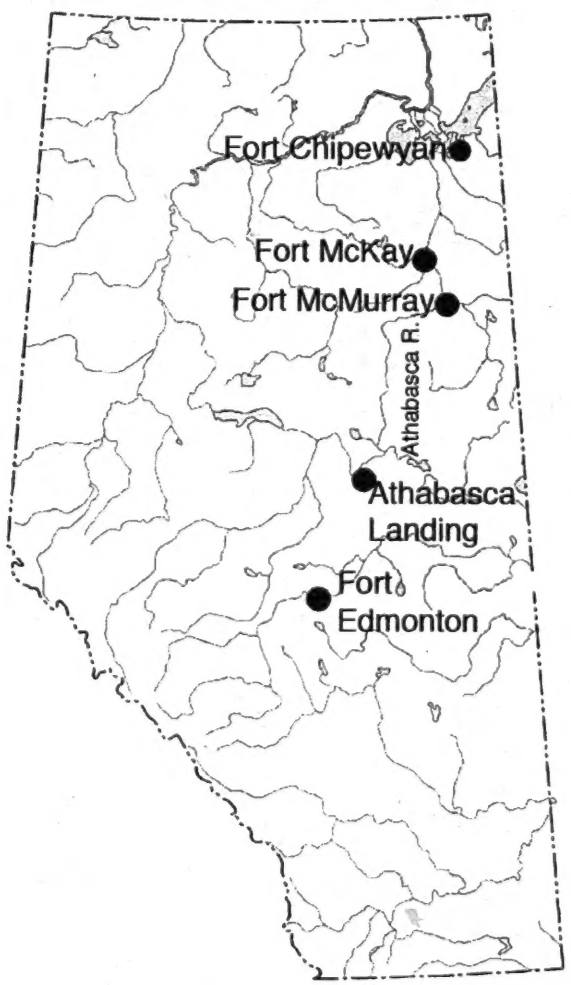

Figure 2: Location of important fur trade communities in northern Alberta.

Rivers and steamboats

Fort McMurray's location at the meeting of two major rivers, the Athabasca and the Clearwater, made it a strategic stopping point on the way north. Ships could come west from rivers in Saskatchewan and Manitoba, as well as from the provincial capital of Edmonton. Before a land route was practical, rivers were vital in moving people and supplies, and Fort McMurray's rivers ensured its continuation. Construction began on a sternwheeler in Fort Chipewyan in 1882; the SS Grahame would follow the Athabasca to Fort McMurray and then move to the Clearwater to meet with ships coming from the east (Huberman 2001). The SS Athabasca, launched in Fort McMurray in 1889, took the more dangerous route through the rapids of the Athabasca river to Athabasca Landing, where a land connection to Edmonton was available (Huberman 2001). With no rail route completed until 1925, these steamboats were vital in accessing the north, particularly during the Yukon gold rush. In addition to creating employment in transportation, the ships required massive amounts of wood to burn for steam power, and thereby created a local timber industry. River transportation remained a vital part of the community of Fort McMurray until the completion of a highway south to Edmonton in 1967.

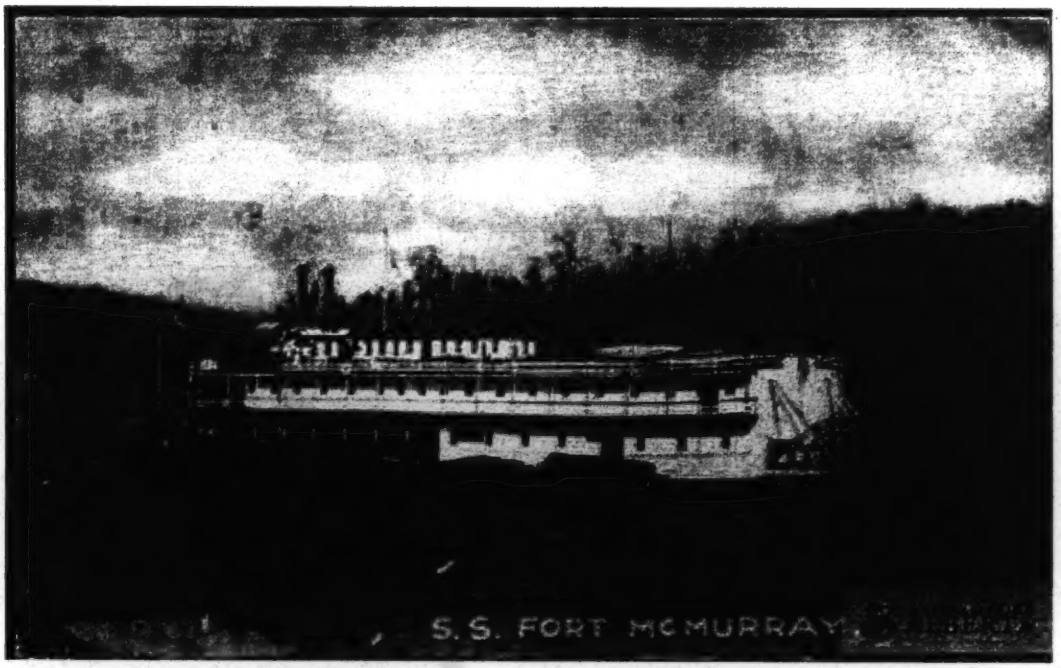

Figure 3: The SS Fort McMurray on the Athabasca River, ca 1935.

History of oil sands development

Cree trappers gave the first sample of oil sands to European explorer Henry Kelsey in 1719 (Huberman 2001). Oil sands from the banks of the Athabasca river had been used by local Aboriginals as a smudge to deter insects, and was mixed with sap to mend birch canoes. Later, European explorers in the region would note the presence of oily deposits on the riverbanks. A botanist, John Macoun, explored the Athabasca region in 1875 and 1876 and reported to the Geological Survey of Canada (GSC) about the oil sands (Huberman 2001). Since oil sands had been identified in Europe in the early nineteenth century and experiments on separation methods were underway, the GSC decided to investigate further. They concluded that separation would be

possible and commercial exploitation was feasible, but that better methods were necessary to remove more of the sand from the bitumen (Ferguson 1985; Huberman 2001). At that time, the theory was that the oil sands were resting upon a large deposit of liquid bitumen that could be accessed by drilling; attempts in the 1890s to do so were unsuccessful. Later, scientists would come to the conclusion that the anticipated liquid deposits did not exist, and that any bitumen would have to be obtained through separation from the sands. The 1920s saw funding from the Province of Alberta through the Scientific and Industrial Research Council (later called the Research Council of Alberta); investigations were led by University of Alberta researcher Dr. Karl A. Clark (Ferguson 1985; Huberman 2001). He proposed to use hot water extraction, a method used in mining, to separate the materials; an experimental plant was set up on the University of Alberta campus and oil sands were shipped in. Proposed products at that time included sealants and paving materials. Private enterprise also became interested in the oil sands in the 1920s and into the 1930s; there were ample opportunities for investment, but experimental plants were plagued by breakdowns and had insufficient operating funds to be successful (Ferguson 1985; Huberman 2001). The Abasand plant opened in Fort McMurray in 1940, and grew into its own community until it was twice destroyed by fire; after the second fire in 1945, it was never rebuilt. The Fort McMurray neighbourhood of Abasand Heights still bears the name of its first commercial venture.

The federal government became interested in the oil sands in the 1940s hoping to reduce its dependence on foreign imports. After its involvement in the unsuccessful

Abasand venture, however, it withdrew and announced it would not again be involved in the oil sands industry (Ferguson 1985). Development was then left up to private enterprise and the provincial government. In the 1950s, oil companies began to acquire leases in the Athabasca oil sands region, although the Government of Alberta was certainly selective about which companies would be granted access (Ferguson 1985). The first plant, operated by Great Canadian Oil Sands (now Suncor), began construction in 1965 and is still expanding today (Caldwell, Zwerman and Olmsted 1979; Parker and Tingley 1980). Syncrude followed in the 1970s, and Albian sands more recently. Oil sands leases cover much of the region; several new projects are in planning and approval stages, and the oil sands industry in Alberta is forecast to continue expanding rapidly. The community of Fort McKay in the Regional Municipality is completely surrounded by oil sands leases (see Figure 4). The oil sands companies or their contractors employ over 60% of the workforce in the region including Fort McMurray, other communities and work camps (Regional Municipality of Wood Buffalo 2005:31). When looking at Fort McMurray alone, just over 50% of the workforce is employed by the oil sands industry. This ratio is the same for the general population and the Aboriginal population; 50% of employed Aboriginals in Fort McMurray work either for oil sands companies or oil sands contractors (Regional Municipality of Wood Buffalo 2005:32). Significantly less of the Aboriginal workforce in the municipality in its entirety is employed in oil sands: this industry employs only 21%, with 53% finding employment in construction, service and retail, government, education and health care, and "other" subsuming the remaining 35% (Regional Municipality of Wood Buffalo 2005:32). The oil sands

afford Fort McMurray the highest annual household income in the province of Alberta: in 2001, $93,234, as compared to $73,488 in the second-highest ranked city, Calgary (Goatcher and Nickerson 2003:98). The average household income for the province as a whole was reported as $64,199 for the year 2000 (Alberta Finance 2004:27).

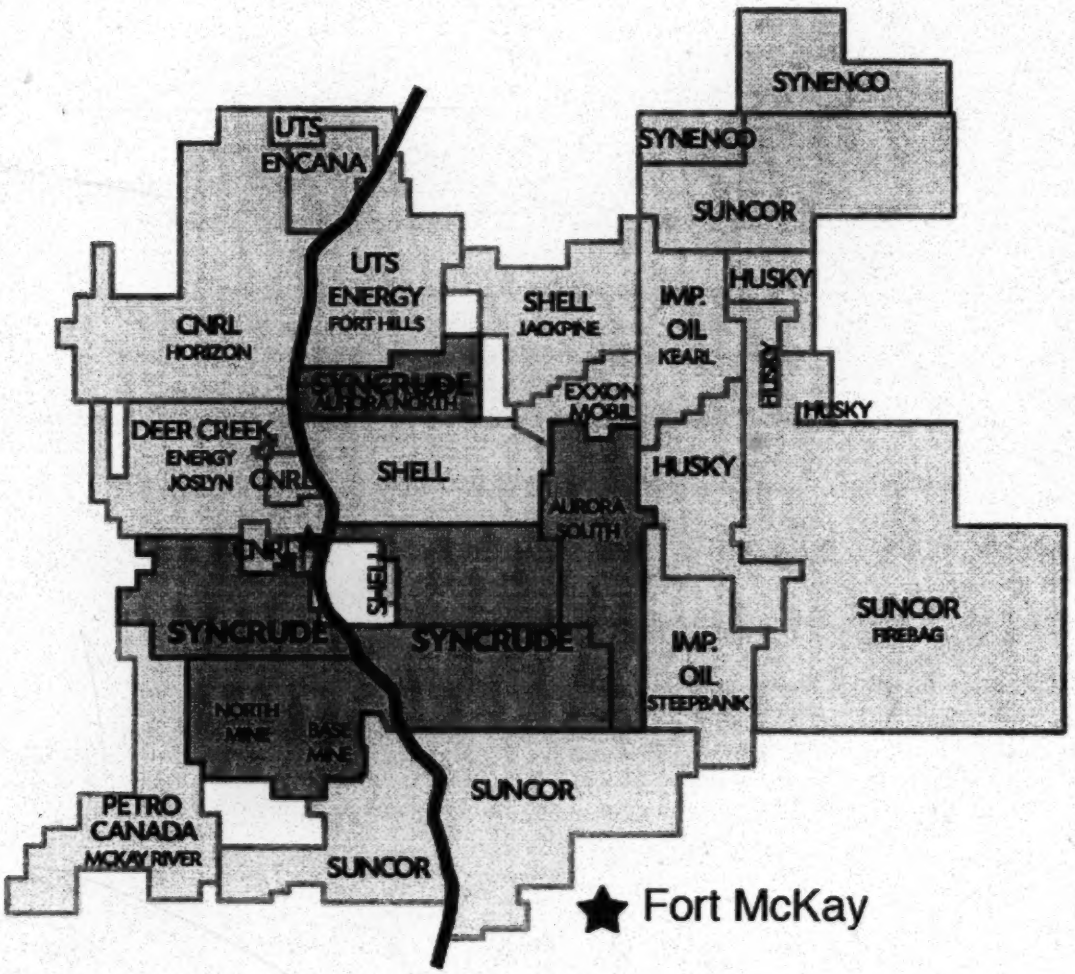

Figure 4: Fort McKay, 65 km north of Fort McMurray, is surrounded by oil sands leases.

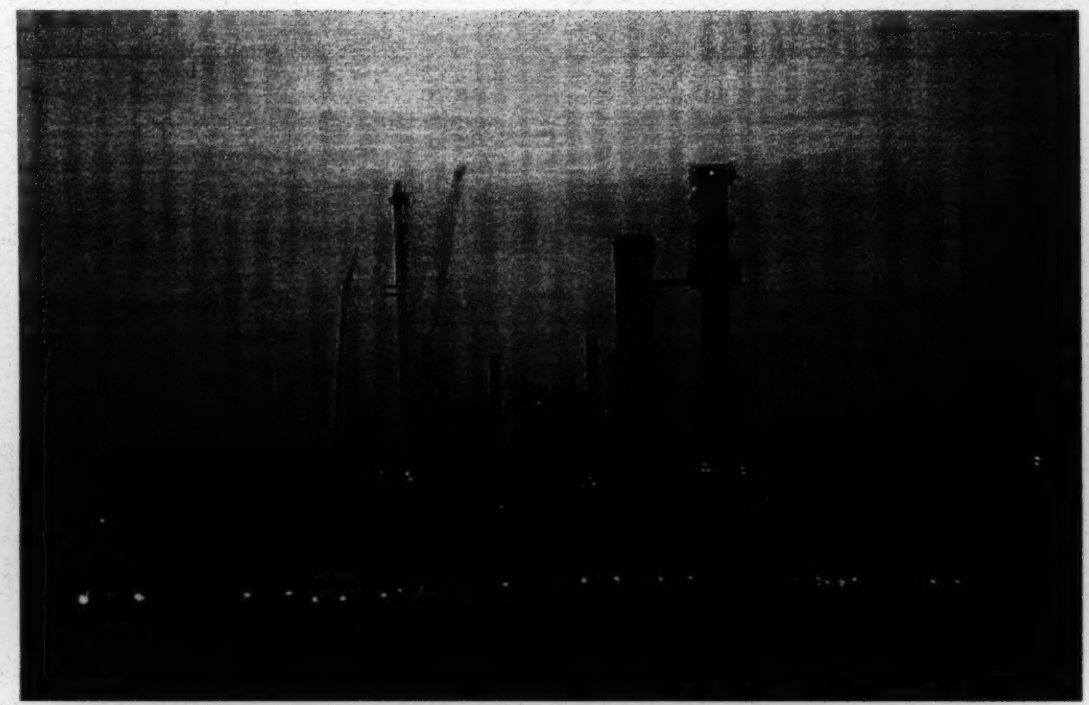

Figure 5: Traffic on Highway 63 near Syncrude's operations during shift change. Photographer: David Dodge. © 2005 The Pembina Institute

Current population

Over the past six years, the population of Fort McMurray has increased dramatically, from 36,452 in 1999 to 60,983 in 2005 (Regional Municipality of Wood Buffalo 2005:6). Although technically a hamlet (see page 52), Fort McMurray is the sixth largest urban centre in Alberta (Alberta Municipal Affairs 2005). As workers flock to the region, housing and infrastructure struggle to keep up; many workers cannot find permanent homes available – and those that are to be found are often too expensive for those new to town and seeking employment – and so are forced to reside in hotels, campgrounds or work camps located in rural areas outside of town near the plants. The 2005 shadow population, defined as those individuals employed by an industrial

or commercial establishment in the municipality and living in hotels for 15 days or more, was over two thousand. Camps housed over nine thousand, up from 3,568 in 1999. With this increase in population, it is not surprising that only a small portion could be considered long-term residents; only 37.4% have lived in Fort McMurray longer than 11 years, and almost 30% have been in town for two years or less (Regional Municipality of Wood Buffalo 2005:24). As mentioned previously in this chapter, 10.3% of females and 8.7% of males in Fort McMurray self identify as Aboriginal (Regional Municipality of Wood Buffalo 2005:17). In rural communities in Wood Buffalo, this percentage is much higher: 47.3% of females and 45.4% of males considered themselves to be Aboriginal (Regional Municipality of Wood Buffalo 2005:16). In the province of Alberta as a whole, Aboriginal peoples represent 5.3% of the population (Alberta Finance 2004:21).

Figure 6: Highway 63 in Fort McMurray. © mymcmurray.com

Local government

Although Fort McMurray is often referred to as a city, it is in fact a hamlet. It chose to be unincorporated in 1995, and became a part of the Regional Municipality of Wood Buffalo. The municipality also encompasses communities that have historically had significant Aboriginal populations: Fort MacKay, situated amongst the oil sands plants, Fort Chipewyan upriver on Lake Athabasca, Janvier and Conklin to the south. In these rural communities, almost half of the residents consider themselves to be of Aboriginal heritage (Regional Municipality of Wood Buffalo 2005). Newer developments are also growing in the municipality, such as Saprae Creek Estates east of town, and the population of the entire municipality reached over 73,000 in 2005 (an increase of over 30,000 from 1999). The various communities within the municipality are represented through council members: three from Fort McMurray, one representing Saprae Creek Estates and Draper, one for Fort Chipewyan, Fort MacKay and Fort Fitzgerald, and the last for Anzac, Conklin, Janvier, Mariana Lake and Gregoire Lake Estates. These councillors and the mayor are elected by residents to three year terms, and are involved with various boards that community members are also welcome to join, such as Housing and Development, the Community Services Advisory Committee or the Recreation Board.

Since the late 1960s, Alberta has been governed by political conservatism, and is generally considered the most "right wing" of the Canadian provinces. The party in power for the province is the Progressive Conservatives, advocating for decreased

government involvement in industry, self-regulation and privatization. The elected Member of the Legislative Assembly for Fort McMurray is a member of this business-friendly party, and the local Member of Parliament belongs to the federal correlate, the Conservative Party of Canada.

Landscape

The terrain of the region significantly affects the layout of Fort McMurray. The Athabasca River divides the hamlet into east and west sections, and the single bridge can make traffic bothersome. The flatlands in the Athabasca and Clearwater valleys, home to municipal and provincial buildings, commercial developments and some residential areas, are prone to flooding and require the community to be on guard during spring breakup and summer rainstorms. Surrounding the rivers, the landscape is quite hilly and makes it difficult to create new neighbourhoods to accommodate the influx of workers. Travel between neighbourhoods is difficult due to the distance between them and the steep slopes; for most of the year, cold weather and icy conditions make it necessary to drive or to take public transportation rather than walk or bike. Highway 63 runs through town to the plants; it is the only road in or out of the city. This main artery is often clogged with private buses contracted to take workers to the plants and back to town, as well as private vehicles and transport trucks taking supplies and equipment to worksites. Such traffic has been identified as contributing to levels of pollutants in the town, although not on the same scale as the major sources, the oil sands operations (BOVAR 1996).

Figure 7: Buses heading to oil sands plants. Photographer: Brent Foster. © National Post.

Figure 8: Tailings ponds, as seen from Syncrude's reclamation area. Photographer: Shelby Mitchell.

Recreation

While commuting to work by foot or bicycle is not normally an option in Fort McMurray, there are plenty of other opportunities for exercise. The city's location in the boreal forest provides opportunities for hiking and wildlife viewing, there are walking trails throughout the town, and the rivers make canoeing and fishing easy. The local YMCA has a swimming pool, gym and fitness centre complete with daily programming, and the municipality has provided a Recreation Complex at MacDonald Island that offers curling, rugby, soccer, baseball, squash, racquetball and tennis. An outdoor splash park adjoins a concrete skateboard/BMX park that is frequented by local youth. While there are many opportunities available during the daytime, recreation can be difficult to engage in for those workers whose shifts run overnight, or extend throughout the length of hours that facilities are operational.

Figure 9: The Snye, a small stream that connected the Clearwater and Athabasca Rivers before a flood-reducing dyke was built, now offers a place to launch boats, fish, barbecue, and is also home to float plane docks. Photographer: Shelby Mitchell

While there are many recreational opportunities available, there is a common perception amongst those in Fort McMurray and throughout the rest of the province that workers choose drinking and drug use as their sport of choice. Long shifts do not leave much time for socializing, and so it is not unusual for camp residents to take a taxi into town after work, drink heavily for a few hours at one of the local bars or the strip club, then get a return cab with little time left before their next shift. This kind of social activity contributes to longtime residents' views of transient workers as the cause of traffic accidents, violence, crime, noise and general rowdiness.

Social problems

Social problems in Fort McMurray include homelessness, substance abuse, racism, violence and family problems. Despite the fact that 87.2% of those over the age of 14 are employed, Fort McMurray still encounters problems of poverty and homelessness. The most recent available housing needs count showed that 355 individuals were without a permanent residence; about half of these individuals were Aboriginal (Fort McMurray Housing Needs Count Committee 2004:4). High costs of living are not necessarily met by those employed outside the oil sands industry; even those within it are not exempt from financial and family crises. Individuals and families who find themselves without a home will often look to friends for a temporary place to stay, and some make camp along the river in the summer. The Salvation Army provides 52 shelter beds that are almost always full during winter; Unity House has a few emergency beds for women and children escaping violent domestic situations; the

Fellowship Baptist Church runs a daily soup kitchen, and the Nistawoyou Association Friendship Centre often provides meals for the public. Some subsidized housing is available, and the community is currently attempting to address housing and poverty issues.

Residents of Fort McMurray often mention the problem of drug and alcohol abuse, and the town has a reputation throughout the rest of the province as a place where drugs and alcohol are abundant and regularly abused. An AADAC report on the province of Alberta showed Fort McMurray as ranking third highest in the number of litres of alcohol sold per person over the age of fifteen (Goatcher and Nickerson 2003:11). Certainly in the camp where I stayed, evening beers were a daily event and often extended to drunken nights filled with laughter and conversation, or on some nights, arguments and fighting. Mandatory company drug tests do not seem to have much effect on reducing the use of drugs; if anything, workers use so-called "hard drugs" instead of marijuana, as they are reported to be more difficult to detect. A recent National Post article describes the story of one young man who moved to Fort McMurray, made lots of money as a pipefitter, spent it on cocaine out of boredom, then quit his job to deal crack (Hutchinson 2006). AADAC reported Fort McMurray as having the highest rate of illicit drug offences per person over the age of fifteen in the province (Goatcher and Nickerson 2003:36). Longtime residents tend to blame such behaviour on individuals who reside in work camps, although they are certainly not all abstainers themselves.

Some employees are concerned with the effects that long hours away from home working shifts at the plants have on families. They feel that children can be neglected, marriages can suffer and result in divorce. It is not unusual for workers to move to Fort McMurray without bringing their families along; isolation and homesickness can be a problem for these workers who usually reside in work camps rather than more familiar houses or apartments. One student told me that prostitution is a problem at the camps, as is what she termed "uncivilized hooliganism." Workers report that disagreements are not uncommon at camps or on the job site. Aboriginals can feel victimized by racism, both on and off the job. Some feel they are given menial tasks and fewer opportunities for advancement, and are hired only to satisfy the companies' commitments to a certain percentage of their employees being of Aboriginal heritage. They felt that they were treated with contempt and looked upon as unqualified and unintelligent when working at the plants, and some local Aboriginal people told me that they were often made to leave a local mall because of security guards' prejudices.

Extreme attitudes toward oil and gas: the case of Wiebo Ludwig

Overall, most residents in Alberta can be characterized as being supportive of oil and gas development; for quite some time, oil and gas has provided a significant portion of the province's revenue and high wages for workers. Unemployment rates are low, and most Albertans are confident that should they require a job, one would be obtainable because of the development spurred on by oil and gas industries. The industry is not without its critics, however, and some individuals have taken an extreme position.

In Alberta, landowners' property extends only a few inches below surface; the Crown holds the rights to any subsurface materials. The Crown leases out subsurface rights to companies whose applications to extract minerals are satisfactory; landowners are consulted, but industry and government are not legally required to reach a consensus, and homeowners' objections to drilling or other activities on their property may be ineffective. Industry is allowed to enter the property and construct wells or other necessary structures in order to access the materials they seek; sometimes they drill diagonally in from outside the property, but other times circumstances require modifications to the surface of the property. Regulations stipulate that the company involved is required to pay a rent to the landowner for the section of property rendered useless by industrial operations, and must clean up and remediate the land to required levels. These regulations do not necessarily satisfy all landowners, and conflicts can erupt. The most dramatic and public of these conflicts occurred in northwestern Alberta, in the Peace country.

The Ludwig family moved to the countryside around Peace River planning to make their living off the land without any modern aids; they felt that industrial pollutants were harmful to their health, and anticipated rural living would remove them from such threats (Nikiforuk 2001). Unfortunately for them, underlying the Peace country are large oil and gas deposits, and industrial activity has been increasing in the region. The Ludwigs were unaware of the distinction between surface and subsurface rights, but once they learned of them they tried to oppose development on their land. They

were unsuccessful, and a sour gas well was drilled on the property. The Ludwigs claimed that flares from the well caused stillbirths, miscarriages, sores, rashes and other health problems in their family and livestock (Nikiforuk 2001). The provincial body overseeing industrial developments, the Energy and Utilities Board, denied that levels of pollutants were high enough to cause illness; after many meetings, letters and phone calls, the Ludwigs remained unsatisfied with the provincial response. Wiebo Ludwig chose to retaliate violently; he and a friend were eventually convicted and imprisoned for blowing up a well site in an act of "eco-terrorism." Their other actions included leaving nails in access routes and setting up road blocks preventing traffic to well sites (Nikiforuk 2001). The situation was highly publicized and created fears of more widespread eco-terrorism that were never realized in the province. This example suggests links between risk perception, industrial development, ideology and social structure. Clearly, the Ludwigs and their friends are an extraordinary case, but they likely signal a range of opinions and perhaps uneasiness with the scale and intensity of the oil and gas industry.

Fort McMurray has not seen situations resembling that of the Ludwigs in the Peace country. While there is certainly no consensus on the value of oil sands development, Fort McMurray has grown to its current status solely because of the oil sands; lifelong residents may not share the eagerness of outsiders for employment at any cost, but most are resolved to the fact that development is not going to slow down in the near future. Such attitudes are considered further in this thesis, and will be shown to relate to perceptions of risk.

Chapter 5: Findings

This section presents examples of specific risks identified by residents of Fort McMurray in interviews. These preface a more in-depth discussion in Chapter 6 where perceived risks are situated in broader social, cultural and historical contexts. While I rely on direct quotes in this section, I do not intend to let the data speak for itself, but rather to serve as an introduction to the perceptions of local residents. In this section, as in the entire thesis, I identify interviewees by their initials only, although all individuals gave permission to use their full names in the thesis or any associated publications. As a way to structure the diversity of material gathered, I have identified two thematic categories in my analysis: environmental states and bodily states. This distinction was not identified by my respondents, but is rather a useful tool by which to organize and present data. I do not consider these themes to be discrete or exhaustive, but rather they reflect a general organization for this chapter. Clearly there is overlap between the various themes; for example, the hilly terrain in Fort McMurray discourages walking, increases traffic and pollution, and results in frequent automobile accidents. Likewise, shift work leads to sleep deprivation, inactivity and poor food choices. My research addressed both bodily and environmental states and the results I offer here are therefore divided into these two main groups, and various risks within each theme are introduced. Broader social concerns that my residents identified are examined in Chapter 6.

Bodily states

After dividing residents' statements about particular risks they were worried about

into either bodily states or environmental states, I looked for embedded categories. Within the topic of bodily states, I have identified those states that are attributable to social factors, and those perceived to result from environmental or other physical stressors. A dichotomy between biological and cultural roots is not my assertion; rather, I suggest that these are two potential ways of looking at the causes of upsetting bodily states, that combinations of physical and social factors are represented here, and there may of course be other ways of conceptualizing thematic groupings within these results.

I begin with interview excerpts addressing bodily states impacted by local environmental factors. In the summer of 2004, there were often stories in the media about West Nile Virus; as incidences of the virus began to occur in the Canadian west, people were encouraged to protect themselves from the risk of contraction by using insect repellent.

> BT: In BC we never use Deep Woods OFF, we're always concerned about DEET. Up here, I'm more concerned about West Nile, I'll use DEET. Because they've already had a West Nile case up here, not up here but in Alberta, and that's a concern to me.

Northern Alberta has a reputation for having many mosquitoes in the summer, and BT felt that they had not been as significant a risk in her previous home in British Columbia. Fort McMurray's location in northeastern Alberta was a risk not just because of its insects, but also because of the cold climate. BT worried about the risk of frostbite, and also noted that being confined indoors led to a greater incidence of colds and flu.

> BT: There are risks to frostbite, which sounds ridiculously low in Canada when you think about it but we have a friend who almost lost her toe last year, it turned black. Because kids don't, kids especially, they don't realize that if they get wet and it's minus 25 out, and they haven't gotten their feet, even if they're sweaty, they get frostbite very quickly. Frostbite is a very big problem here. … That's another issue though, when it's really really cold like that, in BC when my kids would get the flu, we would air out the house. Even if it's chilly out, oh it's minus five we'll air out the house. You can't do that here at minus thirty. Your windows are sealed shut. And you can't get them anyway because there's ice on them. So, infection, colds and flus tend to fly around here quite prevalently.

Other residents also identified colds as a risk in Fort McMurray, but rather than citing the cold and confinement as contributing factors, they identified working at the plants as a potential cause of illness.

> KC: I notice I get sick easier. Last eight months I been sick about six times. And it just seems to never go away, like my cold.
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> JC: … there's times I don't, how would you say, I don't weld for five or six months. I'm in the office here. And when I go back to welding, right, within the first week I get a flu. And that's strictly from the smoke. You know, my immune system's got to get used to it again, and I've been laid off for so long, the first week, it develops, it's fighting. I get an infection. So I know it's doing something against your, it's doing damage to you. … I find McMurray has a lot of flu going on all the time, right? You know when you downtown, you see a lot of people with some type of flu. There's, somebody's always got a flu.

Other work-related health risks that my informants spoke about included nosebleeds, stomach problems and skin conditions.

> JA: I worked on Millennium Project in 2001 [at Suncor] for about eight months and I worked on Coker Road. I was using PPI equipment. There's coke dust flying everywhere, I never had too much problem. You, there were some of the other workers who would get nosebleeds, yeah. … My brother worked for Suncor when the first plant opened, and he used to get, he worked in the lab but he used to get skin rashes and stomach problems.

> DD: … a lot of these things it takes time before it gets into you. I know there's, for me it seems like there's a lot of cases of skin diseases here. I know lots of people have industrial psoriasis and stuff like that. That's, there's a reason why they call it industrial.

While residents identified specific health risks resulting from working at the plant and working near chemicals and other irritants, they also spoke about the health impacts of shift work. My informants identified shift work as leading to sleep deprivation, inactivity, poor food choices and overweight.

> AA: Well I think if you just take the work we do here, we're shift workers. I mean there's proven health risks, alone, in just shift work.

> RF: Shift work is very detrimental to a body. Especially a twelve-hour shift. Because it's not just a twelve-hour: you get on the bus at seven, you're not home until nine, that's a fourteen-hour day. And then you've got to get up to have breakfast, then you're up to sixteen hours. So the idea of actually getting exercise during those six days, the decrease is significant. … Mostly up here it's a sedimentary [sic] lifestyle, where it's, guys come in, they work and then they go home.

> SW: Obesity is a big problem here. I don't really know because I don't know what the studies are right, but I think it could be because I know studies say that northern places usually do have higher, especially in Alberta too. But in Fort McMurray, you know you've got so many fast food things. People, parents working double shift, no time to cook, kids eat out. No time to cook, you bring in food from outside. Even with my family, my mom doesn't work but my dad works a lot, and if my mom's been sick, and I cook like shit, we bring food from outside.

Lifestyle factors including shift work and reliance on convenient store food were seen as leading to health impacts such as diabetes and heart problems, particularly in Aboriginal people. All three of the following residents who identified concerns about

diabetes identify as being First Nations members.

> MV: That's one of the reasons why diabetes is so high in Aboriginal communities, especially up here, you know that's, that much of an influence of European cultures and the way people eat fast foods and stuff like that, it's definitely changed.
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> EM: As it is, everybody was healthy long time ago, and now some people they're sick. They're diabetic or something like that.
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> RC: … And they're having heart problems, they're having high rate of diabetes, all sorts of health related problems because of the change of the lifestyle.

I do not suggest that diabetes is of concern only to Aboriginal people, but that it is a disease that residents know to be increasing in Aboriginal populations due to changing social conditions. Social changes are also manifested as risk in the context of substance abuse. Many residents were concerned about the increase of drug use in the community.

> RC: … You know, there's an impact of drugs, illegal drugs that are coming into this region. A lot of young people are getting into it. Of course it's new to them, they don't know what it is. So again, there's work that needs to be done here, educational work that needs to be done to let the children know the harmful causes that these drugs can, you know, impact on their lives.
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> Shelby: Do you think that's a significant impact on health around here? The drugs?
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> RC: More so now, yeah. Than before. I'm hearing more on the really hardcore drugs, like the crack cocaine, you know, new drugs that are coming to this region. Which are very, very harmful to the people here.

I learned in other interviews that residents see the increase in drug use as directly related to the oil sands industry.

> MV: You know, substance abuse is a lot higher now because of the influx of the oil companies up here.
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> RF: … However, because money is so easily attained, I think maybe the quantity being consumed by the individual is increased. So the usage, the daily usage, the daily intake is probably higher, but if you look at the actual, how many people are actually doing drugs, it's consistent with the [national] population.

Along with drug use, residents also identified heavy drinking as a risk in Fort McMurray.

> GK: I remember somebody saying when I first came here, hey, if you're not an alcoholic now, before McMurray, you will be.
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> RF: You stay here, you become, it's almost like cabin fever. You get caught up in the drinking, Wednesday, Thursday, Friday drinking.

While residents stopped short of saying that substance abuse, legal or otherwise, was encouraged, they certainly expressed that the social climate in Fort McMurray allowed for people to engage in such unhealthy activities. The town was also more forgiving of smoking than other places that residents had lived before coming to the oil sands.

> BT: I've lived in Ontario, BC, and we've lived here and south of here. More people smoke here than I've ever experienced in my life. More people are adamant and arrogant about their smoking privilege. And yet at the same time they don't want their children to smoke.
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> RF: I notice one thing. Lower educational standards, high incidence of smoking. High incidence. I'm from BC, and like the last couple of years they shut down smoking completely. Up here it's, "I'm going to smoke" … like on

> the east coast, where smoking is so acceptable. It's part of the culture. And you see a lot of it up here.

In light of the high prevalence of smoking, it is not surprising that residents also noted an increase in cancer in the community.

> AA: It's, you never used to see it and just, I don't know if it's because I've been so isolated, but cancer is really bloomed in Fort McMurray, I mean there was a time when I didn't know anybody that had cancer. Now everybody has somebody in their family that's dying of cancer.

The people I spoke to tended to attribute cancer not to smoking, but to living and working near the oil and gas industry.

> JA: The one young worker that I knew that died of breast cancer worked for years and years, probably with toxic cleaning stuff which wouldn't be tolerated now. But she lived in MacKay, so I think you will see, my personal feeling is that people living downwind of MacKay now, there's lupus and cancer. And I believe, and my friend believed, she's dead now, and her husband's also sick.
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> RF: Also you're starting to see a little bit of, or increase in cancer rates. That's maybe about what's going on, the splitting of our PAHs [polycyclic aromatic hydrocarbons]. Hydrocarbons. Maybe it's also because now you're getting a bigger population so now your rates are going to rise. You have to draw a correlation, I don't know how much that is, but there are PAHs, that we get tested once every two years.

Two residents that I spoke with related cancer to industry, but included lupus as a risk as well.

> RC: But you hear a lot of sad stories when it comes to cancer, lupus that kind of thing. … We've seen a very high increase of cancer, we've seen a high increase of lupus.
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> JA: There's a lot of people with lupus.

Lupus is an autoimmune disorder of unknown etiology. Research continues into the causes of the disorder, and some studies are investigating the role of silica dust as a contributing factor. Silica is found in sands and glass, and silica dust is associated with mining activities; no scientific conclusions have been made, however, definitively linking lupus to industrial operations (Cooper et al. 1998). Despite the lack of proof, residents maintain that environmental conditions put them at risk. Some residents were concerned that air pollution was responsible for conditions such as asthma and allergies.

> BT: So, and we've got two or three more sites going to be starting soon. I mean it's great for money, but when you have to use ventilin all the time, that's not so good. People don't realize that ventilin, because it is a huge thing here. Everybody has asthma. Almost everybody. There's a lot of huge huge population has asthma. To use your ventilin more than twice a week is bad for you. You know, and I use mine, in the last while, I had used mine two times a day for about a month. … Apparently there is the highest risk of asthma in children, highest rate of asthma in children than anywhere else in the province, in Fort McMurray. And you can see that especially in the wintertime because you look up the river, you can see the plumes coming up, and they say it's low because of the pressure system. And the city is very smoggy in some of the wintertime. And asthma is something that concerns me because my kids both have it as well as my husband and I, so that is a definite health risk.
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> AA: … I have seen the health of the people in Fort McMurray deteriorate. Everybody and their dog has somebody that has asthma in their family.
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> JC: … And that's the other thing, notice a lot of people in Fort McMurray have allergies. You know, and is it from what we breathe in from the plants? Could be.

Residents perceived a variety of different risks to their bodily health, and also

suggested variable causes for impacts. Climate, social factors and environmental states were all cited as etiologies for the potential diseases that residents associated with living in Fort McMurray. Having offered a picture of the health risks that my informants discussed, I will now move on to a presentation of the environmental risks that residents identified.

Environmental states

In this section, I introduce the environmental risks that my respondents discussed. I include statements that residents made about broad issues such as global warming and acid rain, as well as concerns that are specifically local. Residents spoke, for instance, about the health of plants and animals in the region deteriorating as a result of contaminated drinking water. I begin with participants' views about local air quality.

> BT: The only thing that I would be concerned about, that I do get concerned about, and my kids get concerned about, is the Diversified trucks, Diversified buses, kick out a whack of black smoke all the time. I'm thinking you know if I was in BC and my car did that, I'd be pulled off the road. You wouldn't be allowed to. They do a lot of that, because the trucks all go through, they're on the highway but that's in the middle of town. And they all kick out a lot of black smoke. That's really irritating. I'm not sure what those implications are for our health, but I know there's a lot of carbon here and that's monoxide. So, the black is the carbon and the smoke is the carbon monoxide so, can't be good. But, and in the wintertime, see now, they kick it out and it dissipates fairly quickly. Because the air is light. But in the wintertime the air is very heavy. And it sits there. And it sits there and sits there. You drive through it.

I have already introduced BT's concerns about asthma, and so it is not surprising to see her concern about local air quality. For her, being able to see the black smoke that a local company's vehicles emit is visible proof of poor air quality and results in bodily impacts. An Elder from the Fort McMurray region also expressed concern about air quality, and referred to its effects on her body.

> EM: I don't know later on what's going to be like, eh. To them, too much that fumes and smoke and stuff like that. Even me, when I go down that way, like sometimes the, they took the seniors out to go see the buffaloes and stuff like that, and then when I, that smoke gets right in my chest right away.

Local oil and gas companies provide some community support, such as transportation for Elders from Fort Mackay to visit different sites and access services in Fort McMurray. One such trip included a visit to the reclamation area near Syncrude's front gates, where some buffalo have been brought to live. Although the soil here has been reconstructed and trees and grasses planted, for EM the air quality has not improved near the Syncrude site. Another Elder offered his opinion on air pollution:

> SM: Now that's, that's air pollution, eh? You can even smell the air pollution in Fort Chip. You get all the air pollution up there when there's a south wind blowing. Other than that, you get, you go to, you fly to Fort Chip, get off the plane and right away you get the fresh air. You go to Lac la Biche, go stay there a day or two, and you get the fresh air over there. Come back to McMurray you don't even know when you're getting all that air. Lived in the lower town site close to Snye, I don't know how much pollution but there's some mornings you could hardly breathe.

To this Aboriginal Elder, air pollution could be sensed in particular localities. Fort Chipewyan, or Fort Chip as it is often called, is part of the Regional Municipality of Wood Buffalo and is located on the northwestern banks of Lake Athabasca, past the oil sands developments and accessible only by air, water or winter road. The town of Lac la Biche is 291 km south of Fort McMurray and its oil and gas development is much less concentrated than the Athabasca region. For SM, both communities offer better air quality than Fort McMurray. Another resident spoke of air pollution as being located in a specific geographic context:

> SJ: The Fort Mackay band … they're seeing the water systems devastated. The

> fishing industry, air quality, they have to deal with all of it. There's fallout in their community, there's all kinds of things going on. And I believe that they're, they've been fighting it year after year. Like they, it's a continual fight out there. So yeah, I believe that there are some devastating effects to communities and to the surrounding area.

This industrial worker spoke about air pollution as having an impact particularly on Fort Mackay, a community surrounded by oil sands developments. He was also concerned about water quality, as were many other residents.

> GK: ... one of the major major concerns that comes to mind here is water. Is the Athabasca River.
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> MV: The biggest thing that grossed me out about coming up here is the water. Like the water is just nasty.

Some residents spoke of the water quality comparatively, saying that local rivers and lakes were not as nice or clean as elsewhere.

> BT: From what I have been told, the river is mediocre. I wouldn't swim in Gregoire Lake if you paid me to. It's pretty algae-full, and it's got leeches. And I'm used to the Okanagan, which is crystal clear. So it's a totally different issue. The river, the native population in Fort Chip complains about the rivers often. And since that's how they used to make it, I kind of listen to them.

The Athabasca River is of great concern to residents who would like to use it for recreation and as a food source, and to local Aboriginal peoples who can remember using its water for drinking and cooking before its quality degraded.

> JA: And they were seeing already, probably in the '80s, late '70s, the water, you couldn't drink the water.
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> EF: … I mean the river you can't swim in or eat the fish out of because it's poisoned, I mean that's not just from like, not just from the Syncrude and

> Suncor and stuff, people are always throwing shit in there, and then you've got motorboats in there leaving oil in it. It's fucking horrible. They used to swim in the river but you can't now because you'll get some kind of skin disease.

Although natural background mercury levels in the Athabasca River are higher than rivers elsewhere in Canada, residents did not hesitate to implicate human activity, especially industrial practices, as contributing to potentially harmful environmental states.

> AA: The Athabasca is probably one of the highest industry rivers in Canada, it's got three or four pulp mills. The two oilsands plants, three now, oilsands plants piggybacking off of it, so it's definitely changed.

Before the Athabasca reaches Fort McMurray, it passes through other Alberta communities and industrial sites, and so some residents worry about the cumulative impact, not just oil sands activities. The following respondent was involved in a local group, the Cumulative Effects Management Association.

> RC: I know for a fact, this also has a big damage happening with the water in this region. And that's what we live by is water. I believe if the water's damaged in this region it means we're looking at some very very difficult problems in the future. Already the Elders are talking, and I know, personally I know myself, like thirty years ago, thirty five years ago we could scoop a pail of water anyplace, in a creek, in a river, in a lake, any lake we come across and drink the water and use it for tea or use it for coffee, use it for cooking. Today we can't do that. Today we're made to live on the chlorinated water from the water treatment plants and that. Even that is becoming a problem in itself. Now we're being told to buy our water, bottled water. To try and avoid drinking the chlorinated water. What is it going to be next? And I know for a fact that the bottled water that we're drinking is not healthy. It's dead water as far as I'm concerned. It's not alive, it's dead.

This local political figure and activist goes on to express his concern for how not only human health and activities, but animals', too, are affected by water quality.

RC: What about the animals out there? The bears. The moose. The deer. The wolf. The coyote. The fox. On and on and on and on etcetera. What about this animals that have to live off this water, off the streams, off the lakes? What's going to happen to them? This is the reason why I'm really concerned about the state of the environment. If I can't drink water out of a lake or stream, then something's wrong. And if there's something wrong, then, you know, I'm concerned about the wildlife.

RC was not alone in his concern for the health of local animals:

JC: … Like Syncrude has gone as far as having the buffalos, right, and stuff like that, right. And, is the buffalo meat good? You know, is there damages from them eating the acid rain grass? We'll find out in time, I guess.

Other residents advised against eating wild animals.

Shelby: Can people [eat wild meat] here?

EF: Here? No. I wouldn't recommend it. Because the environment now is, there's too much pollution around here. Like I mean, just the sites and stuff, sure you can go way out in the bushes and shoot a moose and you can eat it, but I mean anything around here, if you see like a deer drinking from the river, you go kill it and you eat that deer, you're more likely you're going to catch some kind of disease from that.

KC: Animals I wouldn't advise, I wouldn't eat them. Because I know there's a lot of runoff in where they get their water and all that stuff, too, right, so I wouldn't. Don't even dare trying. Just because I know what, the way where our plant is, it's close to the water, right, and it's not very good.

Eating fish from the Athabasca River was also identified as a risk.

AA: No. I mean, they suggest that you only eat one fish out of the Athabasca a week, and if you're pregnant don't eat them at all.

SJ: Well there's been water warnings. There's been fishing advisories, you know what I mean. And even before some of those advisories and warnings came out, people in the northern communities were saying, like they knew there was high contents in the fish. They were testing them themselves. And they were finding things wrong, right, and that's where they, the big fights started coming in, when they started proving that things were going wrong.

> JA: But again, there were, and my friend in Fort MacKay used to fish a lot, the one that died of cancer, and they noticed changes in the fish.

Concern about environmental states also extended to local vegetation. Just as some residents suggested eating local fish and animals was a risk, some noted similar concern for growing vegetables or using wild plants.

> KC: … I wouldn't want to grow things here, for plant wise with the dirt and all that stuff because all the, I know what comes out of the ground at the plants and it's not very good stuff to be around.

> RC: … So the Elders still believe in their original medicinal plants, so there's the herbs out there. And if we're going to have the [oil sands] plants destroying the environment here, what does the future hold for these herbs? And some of them are very very sensitive. We have some sensitive plants out there that people can't tamper with, because if we tamper with them then they disappear and they're gone forever. We are the boreal forest Aboriginal people, and we know what's out there, from generation to generation. And that's how we lived for years, many many years.

RC was certainly concerned about the local environmental risks that he attributed to industrialization, but also felt that the impact extended to a much wider geographical setting.

> RC: … I mean globally, internationally, global warming is happening. This is an international problem. It's just not the region.

One final issue that my respondents identified as a risk has also been of wide-ranging concern, though we hear less about it in the media today than in previous decades. In the 1980s and 1990s acid rain attracted much attention, but government regulations and industrial responses have reduced emissions and decreased the amount of acid rain. It is, however, an issue that is still of concern to some individuals.

> BT: I know my husband is concerned about, and he may know better than me because he was raised here, something you might want to look into, is he won't let my boys, this sounds silly, especially for me coming from the Okanagan where the sky's almost turquoise blue, it's so clear. In the winter when it's just starting to snow, big flakes, we'd go out and catch them on our tongues. He won't let them. Says there's acid, there's smog, there's pollution in the air, and that's coming down on that snow. And now he may be more informed regarding that, because he's worked at site and he was raised here. So maybe when he was a kid they were warning kids, because they don't seem to now. But he's quite adamant about it, he doesn't, he's not a freak about health issues usually. So, it's something to really wonder what kind of heavy pollution comes. Sometimes the snow comes down and it's not that white. So sometimes you've got to wonder.
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> JC: … Right, sometimes you can feel the acid rain here. You know, and how much damage does that do to a person's health? You know, the kids they brought up here and that lived here all their lives, like I been here like I said since '69, like there's times that if you ever go to Suncor and just park your vehicle, and at the end of the day how much acid rain or dust has been landed from the air. It's quite damaging actually if you really keep a close eye on it.

In this instance, acid rain seems to stand as a metaphor for uncontrolled and widespread ecological damage due to industrialization. The use of this term may also suggest an absence of vocabulary for environmental damage associated with development of the tar sands.

As can be seen from these excerpts, there is a wide range of possible risks selected for concern by residents of Fort McMurray, varying from the physical to the social. Not all residents hold the same views; some are concerned about air quality, some about alcohol abuse, some about a combination, and some see relatively few issues to worry about.

> RB: My kids are health and my family's very healthy, we were up here for quite a few years and my mom and dad were healthy all the time.

While certain residents were worried about the risk of poor air quality or water quality on their health and that of plants and animals, others felt that such factors were not a concern.

Although I have divided risks that my respondents identified into two categories, their statements show that environmental states are perceived to affect bodily states, and there are interactions between different risks. Additionally, residents likely hold other concerns that were not mentioned in interviews. Much of the interview content did not address particular risks specifically, but also included discussion of wider issues; I encouraged respondents to tell me about what they though was important in the consideration of potential risks in their community. While this chapter has addressed only the particular risks, such as cancer and water pollution, that my respondents noted, my next chapter will analyze these specifically reported risks in a broader context of views about industry, economy, government, environment, what it means to live in Fort McMurray and how risks become known to the public.

Chapter 6: Discussion

The previous chapter outlined specific risks that residents reported to me in interviews. This chapter will look at more contextual topics such as government, industry and environment to help situate risk perceptions in a wider social and political context. Residents told me that they were concerned about more than just the biophysical risks particular to their town that were presented in Chapter 5; in the words of one informant, "when we're talking about impact, we're talking about impact on everything" (RC). As I identified in the literature review chapter, the social science literature argues that social, cultural and historical factors are important in understanding risk as a lived phenomenon. Consequently, in this chapter I discuss the relation of perceived risks to attitudes about wider institutions and concepts, linking excerpts from my interviews to appropriate literature. I have grouped residents' comments thematically into conceptual categories such as *environment, change* and *knowing risk* to facilitate analysis, but remain aware that these are interrelated topics and not discrete categories, just as specific risks identified in the preceding chapter are connected to each other. I begin this chapter by discussing how residents' attitudes toward government are associated with risk perceptions.

Government

As I discussed in the literature review, experiences of risk can affect attitudes toward institutions, and, concordantly, attitudes toward institutions can affect perceptions of risk. For example, MacGregor and Fleming (1996) note that attitudes toward government and industry can affect risk perception. Bush, Moffatt and Dunn point out

that "empirical studies have found that the perceived trustworthiness and social credibility of scientific information are strongly framed by, and are interrelated with, attitudes toward the institutions providing the information, politics, control, and trust" (2001:215). In keeping with these observations, and Kasperson's (1992) suggestion that risk experience must be understood in terms of interaction between processes and institutions, in this section I examine how views of government interrelate with health risk perceptions.

Interviewees supported government legislation and enforcement of environmental regulations relating to the oil sands industry. Degrees of confidence in the province's effectiveness in monitoring local projects, however, varied; some residents were happy to see that regulations had become more stringent over the years and that the provincial government was doing more to reduce pollutants and impact than they had in the past. One longtime resident noted:

> JA: I was born and raised in this town and there was 1200 people in it. Seeing over the years when the first plant went through, it was a lot of spewing of things that wouldn't be tolerated today.

She went on to say that although she has noticed a reduction in pollution, she would like to see the government create even tougher rules. She did not think that the Province of Alberta was doing enough to satisfy the concerns that people like her have about environmental and health impacts, but rather pandered to industry:

> JA: They know that in Alberta, it's called the Alberta Advantage, that it's open for business, so I think they make deals because they know these projects are approved often. The unions know, the oil companies know that the Alberta government, and of course those are my views … they know they're going. It's all pre-approved. Pretty well. They go through the protocol of environmental hearings and deals are cut with the bands and with local

people.

Aboriginal authors have suggested that risk assessment methods do not adequately address the social, cultural and spiritual values, beliefs and practices of Aboriginal residents (Arquette et al 2002). Such sentiments are certainly displayed in the transcripts from JA, a Métis person unsatisfied with the assessment and approval processes. Other residents agreed that the process by which industrial development is approved and existing projects are monitored in Alberta is a gloss, more a formality than an attempt to address concerns about potential impact. For example, one oil sands worker suggested that the Province encourages its monitors to ignore violations rather than risk losing the support of Fort McMurray industry:

> RB: I think the inspectors are here but I think they're paid to turn a blind eye and it goes on. I'm sure that they're told even from down there, that their bosses probably say "don't worry about it," they have a deal, this is, like I said, if it was down south, around Edmonton with people seeing flares like that, there would be questions.

The isolation of the plants, according to this worker, allowed the government to ignore the conditions or violations in the Athabasca region, whereas in a more populated region like the capital, Edmonton, residents would be more likely to see flares, contact officials and make their concerns known. Assertions that rules are being knowingly broken also came from those outside of industry. A local activist and federal political candidate related this anecdote:

> RC: I went in to the computer room and talked to a couple of fellows that were monitoring the computers there, and I personally saw the computers where it was showing the exceedence on the sulphur dioxide, air machine. And I asked the two fellows and I told them, I pointed out to them, I said 'you're exceeding the limits, what are you guys doing about that?' And he said 'we send it to the provincial government but we never hear anything back from them.' In fact, they said 'the more oil we make, the better it is for us.' So it gives you an idea of how this whole monitoring is being looked after by the

provincial government.

To this interviewee, it was obvious that the Province of Alberta was more interested in protecting its revenues than in protecting the environment. He was not, however, anti-industry; rather, he wanted to see the government focus on monitoring cumulative impacts, and consider slowing the pace of development.

> RC: I have nothing against the economy that's happening in this region. I do have a problem with how rapidly it's growing. I think the government should take a little more time before even thinking about giving out more licenses. I think we have more than enough happening right now, not only in this region but from these industries I think nationally, there's enough money being poured into the federal resource pocket. And also the provincial government, they're getting multi million dollars from these industries.

If revenues are adequate already, why give out more licenses and contribute to further environmental damage? For RC, the extra money was not worth the risks he viewed as associated with industrial development: cancer, lupus, air pollution. His faith in the government's abilities to enforce existing legislation and to create new regulations to accommodate cumulative impact was not sufficient for him to endorse additional approvals. Although others in the community were happy to see new developments moving in, and certainly many people outside of the region welcome contributions to provincial and federal revenues, lack of trust in the governmental process of environmental regulation was common. From a plant worker worried about acid rain and the downstream effects of industry:

> JC: Doesn't matter what they promise, what they've said. Do I believe the government's done enough? I believe no. I think government could be more highly involved.

Albertans are known in Canada as being in favour of privatization and minimal involvement on the part of the government. This stereotype does not apply to

everyone; among people I interviewed, the majority would like to see more stringent regulations enacted and enforced in an effort to reduce pollution, and would like to see a more obvious regulatory presence to make industry accountable. Embedded in their comments is a desire for managed growth that will avoid the boom and bust cycle that has been seen before in Alberta. I will next examine how attitudes to industry are associated with perceptions of risk.

Industry

As was noted in the previous section, attitudes toward institutions, government and industry included, can affect risk perceptions (MacGregor and Fleming 1996). Confidence in industry itself and the perceived credibility of the information it presents have an impact on views of industry-related risks (Wildavsky and Dake 1990). Beck (1987; 1992; 1999) suggests that in the age of risk society, people have very little confidence in industry and are quick to suspect it of creating problems for health and environment. While I certainly found some individuals who would seem to support Beck's suggestion, my findings from Fort McMurray would suggest that his ideas do not necessarily apply to all situations or locations; in this industry-dependent town, many attitudes toward oil sands developments were positive. Residents were in favour of more government regulations on industry, and some suspected industry was allowed to break rules without punishment, but even these individuals were not all opposed to industry in general or the companies in particular. People appeared to be aware of the potential for harm, but had confidence that industry was doing what it could to mitigate impact. Said one worker:

JC: I think Suncor is very environmentally friendly. I believe that.

I emphasize that risks are selected according to a particular worldview (Douglas & Wildavsky 1982). For this oil sands worker, exposure to industry and its impacts is a familiar daily activity and thus JC may not select it for concern; familiarity with a potential risk can be a factor in attenuating perceptions of that risk (MacGregor and Fleming 1996).

Acceptance of industry is not confined to those directly employed by oil sands companies. A local political and environmental activist maintained that he is not against industrial development. Further to his comments in the previous section regarding government, RC had this to say:

> RC: All in all I think industries are working hand in hand and really focusing on this whole environmental issue, and a lot of things that are happening are gaining grounds to the betterment of the environment. But we still have a long ways to go.

He feels that although industry needs to keep moving forward on environmental protection, it is making an effort to reduce impact and risk. His statements show that we cannot assume that an environmentalist will automatically be opposed to industry, that perceptions are much more nuanced. While anti-industry attitudes may be linked with a concern for the environment, such generalizations cannot apply to all individuals, and we do not need to draw a line between environmentalists and those employed in resource extractions industries, a popular dichotomy that White (1995:174) addresses:

> Given the tendency of environmentalists to exaggerate boundaries, to make humans and nature opposing sides in a bitter struggle, any attempt to stress the importance of work needs to begin by blurring the boundaries and stressing

> human connections with nature. … Work entails an embodiment, an interaction with the world, that is far more intense than play. We work to live. We cannot stop.

White suggests that one need not choose between being aware of environment and being connected to land and nature, and working for a living. Industrial workers are just as capable of caring for the environment as office workers, and some of my respondents who worked in the oil sands believed that companies were making their best efforts to minimize pollution. There are, of course, various opinions, and I spoke with individuals who were unhappy with industry and did not believe its efforts were anything more than 'greenwash,' or an attempt to placate the public:

> JA: I think it's more PR than anything else.

As Douglas and Wildavsky (1982) point out, there tends to be more public outrage when involuntary risks, such as exposure to pollutants, are attributed to people or institutions making huge profits. In an unrecorded conversation, JA expressed her awareness of the immense profits that the oil sands companies posted the previous year, and was upset that such proceeds were not being better shared with and invested in the community. She did not trust the companies to effectively protect their workers, let alone the region in general:

> JA: But there's workers who don't seem to realize that it's dangerous for them. … But Syncrude will not talk about all of that, there's a lot of stuff going on behind the scenes.

Nor was her unhappiness with industry confined to those companies in the oil sands specifically. She recognized developments upstream as impacting her home:

> JA: The fact is here in Alberta we're not just affected by the oil sands industry, we're affected by the pulp mills that, a lot of their stuff is coming into the Athabasca region.

Further south in the Athabasca River basin are five pulp mills that rely on the river's waters (Northern River Basins Study 1996). The Northern River Basins Study team attending to traditional knowledge found that there was a pervasive belief that pulp mills poison the water, and that the quality of the water is perceived to have deteriorated over the years. Other Wood Buffalo residents that I spoke with mentioned in casual conversations that pulp mills contributed to the impact on the Athabasca River; we can safely assume then that JA's concerns with both the oil sands and the pulp industries degrading river water quality are not unusual, especially for people of Aboriginal heritage. JA shows that attitudes toward industry can be associated with risk perception, as social science literature asserts.

While some interviewees were unsatisfied with industry and associated it with health risks, others were more positive toward the oil and gas companies and realized the potential for risk, but did not see significant cause for concern. MacGregor and Fleming (1996) suggest that people are more willing to accept risk from activities or materials seen as familiar; working within industry can create a familiarity with the processes and products involved and their effects on bodies and environments. One way of envisioning confidence in industry, then, is to see it as the result of prolonged contact with an everyday entity. In the next section, I explore Brown's (1987) idea that workers may ignore risks, or simply not select them for concern, in an attempt to reduce workplace stress and more general anxiety. Whether workers are aware of risks and choose not to worry about them, are simply familiar enough with them to not focus on them, or if there are other factors affecting their risk perceptions, my

respondents show that industry does factor into their nuanced perceptions.

Economics

I will now examine the idea that economic considerations have a role to play in risk perceptions, that the financial benefits that come with industry can lead some to think that the associated benefits outweigh potential risks. In a region known for its high salaries, money is a common topic in Fort McMurray. When discussing risks to health and environment from industry, some residents maintained that despite the potential for harm, great economic benefits accompanied oil sands development in the Athabasca region for individuals, the community, and the province as a whole. Workers are aware that the profits from their labours are used to contribute to provincial social programs and infrastructure:

> RB: These big companies put a lot of money into the government to keep things going.

RB had been living and working in town on and off for forty years, and felt that both he and his family were in good health; for him, the economic payoff was welcome and certainly took precedence over any risks. One resident worker who perceived more risks from inactivity and overweight than from industry-related impacts felt that the rest of the province's population needed to remember where public monies come from:

> RF: My girlfriend down at U of C used to say 'it's kind of sad that they're polluting all of this,' and I'd say 'but, guess what? You want to be a nurse, where do you think that money comes from?' You have to sort of straddle. If you don't have that, you don't have public hospitals, teachers, you don't have a judicial system.

For these individuals, the benefits from industry outweigh any potential risks. Brown

(1987) notes that this is common behaviour for workers, who realize that with hazard comes the opportunity to provide for families. Even individuals who are concerned with health and the environment recognize the motivation for working in the oil sands:

> JA: They know that there are health problems associated with working in this industry, but they do the job because they need to feed their families. So it's a tradeoff for their health.

The opportunities afforded by employment in Fort McMurray can be vital to those going through hard times:

> RF: I talked to one of the girls on the bus, and she was a stay-at-home mom and then she got divorced, she didn't have anywhere to go so she came out here and took an engineering program to drive a truck, now she's making sixty-eight thousand a year. So you're handcuffed. You may say, 'oh, it stinks,' but then again, sixty-eight thousand dollars a year for someone with no education?

These individuals demonstrate that risks can sometimes be overlooked when the benefits are seen to be compensatory. Brown (1987) further notes that in addition to salaries outweighing risks, some may simply prefer not to acknowledge associated risks in an attempt to reduce stress; if one admits that harms are possible, the resulting anxiety may be too much to handle.

With the good comes the bad; some residents maintain that high wages and salaries in Fort McMurray contribute to problems of alcohol and drug abuse:

> SW: I think a lot of Fort McMurray's problems are because people have so much money.

When there is much money to spend, and few opportunities to spend it, workers in my camp told me that residents have to "play hard," just as they work hard. Nights of

determined drinking and drug use are reported as being common for camp residents and town-dwellers alike. Other activities, as well, must be concentrated. For example, workers may work six days on, then six days off, and spend their off-time traveling around the world, reported one woman who worked for a local plant:

> AA: I think there's a lot of people in Fort McMurray that live a little faster than maybe they should because they have all that money … that kind of stuff takes its toll on you.

Impacts on health, then, are related not only to pollutants at the plants or poor air quality, but also to rushing through leisure time and "living fast." For AA, the lifestyle afforded by high salaries was itself a risk. While these two residents represent the opinion that money can be harmful to health, a young homeless man at a drop-in centre held an opposing belief about money and health in the region:

> EF: They're more healthy [in Fort McMurray], I'd say. I mean, you go to Grande Prairie or something like that, and you don't have people like you do here. Because everybody here makes lots of money. Everybody's living good. … They get three meals a day, they're exercising, they're doing stuff, they have stuff to do. And then you come down here and you see these people laying around and not really doing anything, barely eating, having a hard time.

From his perspective of not having the monetary means to provide sustenance for himself, those working in McMurray's high-paying jobs and "living good" had the opportunities to eat healthy food and exercise as they should. In his interview, he focused on the homeless population as being the drinkers, and the employed segment as living well and being exposed to fewer risks as a result of their economic situations. For EF, risks accompany poverty, not prosperity. We can see from these interview excerpts that ideas about the interplay of risk and economy are varied in Fort McMurray, and are associated with quite different perceptions of risk: for some, the revenues industry contributes to provincial concerns are of more importance than

environmental damage, which is envisioned as minimal, and to others money leads to health and social problems in the region. I will next examine how varying conceptions of the environment relate to risk perceptions.

Environment

Respondents had different views of the environment, its uses and inherent values, what constitutes 'caring' for the environment. Social scientists like Greider and Garkovich (1994) maintain that views of landscape and nature are socially constructed and malleable. They see landscape as a symbolic environment whose meaning is created by humans, and is reflective of people's self-identity. Different people, then, with different concepts of themselves and their identities and histories, will have varying perceptions of the environment. In North America, as Cronon (1995) notes, nature has been envisioned as either the sublime, or the frontier. Fort McMurray houses both perspectives; it is home to both environmentalists, whom Cronon (1995) and Slater (1995) say employ romantic, moral notions of wilderness and nature, and to those who envision the environment as something to be used rather than observed from afar. According to Cronon,

> the dream of an unworked natural landscape is very much the fantasy of people who have never themselves had to work the land to make a living - urban folk for whom food comes from a supermarket or restaurant instead of a field, and for whom the wooden houses in which they live and work apparently have no meaningful connection to the forests in which trees grow and die. (Cronon 1995: 80)

A newcomer to Fort McMurray, BT grew up in urban British Columbia, a province noted for its environmental ethos, and was concerned with environmental issues. To her, the environment requires caring for in the form of such human actions as keeping

streets clean and recycling: "Most people don't care. We should all be doing it, most don't care." She noted that in British Columbia, recycling is the normal way of doing things, and that there was not even a recycling program available in Fort McMurray. It was important to BT to use as little excess material as possible in order to maintain the 'natural' state of the environment, to keep nature pristine. Considering her assertion that industry poses risks to health and environment (see her reference to air quality and asthma in Chapter 5, p. 61-62), we can certainly see her as representative of the first perspective on environment described by Cronon above.

As a resource-dependent community, it is not surprising that Fort McMurray is home to many who perceive nature as fruitful, as providing opportunities for development and production. One industry worker articulated this view well:

> RF: Because you're dealing with a resource community, they understand [the environment] more than say someone living in Victoria, that you have to mine, you have to cut logs, you have to have agriculture, you just can't live growing tomatoes and hemp. It's a simple fact. … Up here they see more of the idea that the environment is there to be used and harvested.

RF would likely concur with American historian Richard White, who says that while environmentalists tend to overemphasize the borders between humanity and nature, between leisure and work in nature, it is more realistic to see all work as embedded in nature (White 1995). Ingold (1992) agrees that we should avoid seeing a duality between nature and culture, that perception and action are inseparable. Our actions, such as working in resource extraction and processing industries, affect and are affected by our perceptions of the environment. RF, as an industrial worker, perceives the environment (and risks to it) differently than BT, whose engagements with and

conceptions of nature are influenced by her own particular experiences. Remembering that "people select their awareness of certain dangers to conform with a specific way of life" (Douglas & Wildavsky 1982: 9), we see that ideas about environment affect perceptions of risk.

Change

During interviews and informal conversations, residents offered some important observations on change of various sorts. I have isolated them and examine them in this section. Change is an implicit aspect of risk; risk is a potential threat to current ways of living. Dake (1992:34) notes that controversies over acceptable levels of risk are not so much "about the probability of dying, but about what our world is like while we are constructing it." Risk is about the possibility of current situations changing, it is a threat to continuity and the ability of future generations to continue living in the same way as their ancestors. For some people, especially some of the Aboriginal residents that I spoke with, this threat to continuity came up often in conversation, although not framed specifically as 'risk.' Rather, residents would speak about how things used to be, how people used to live and how those patterns have changed. They expressed concern for how subsistence strategies are different today and that young people are not learning about how their ancestors lived, that traditional values, language and various aspects of culture are threatened with extinction. Interviewees were anxious to communicate this information about change and concern for the future in discussions about risk. The linkages they make point to the situated nature of risk within different societies and through different modes of

production.

While some residents that I spoke with expressed the opinion that younger generations were more integrated into the environmental movement because of the education they receive and the general context of mounting environmental concern since the 1970s, one Métis woman stated that people today are less concerned with the environment:

> JA: My father was probably more environmentally conscious because he was from the older generation.

Being 'from the older generation' means having a more meaningful connection to the land due to daily interactions with it in the form of hunting, trapping, gathering wood and water, picking berries and simply being outdoors. Other Aboriginal interviewees noted the change away from living off the land:

> MV: People that come from Mackay and Fort Chip and Janvier and stuff like that, they, well of course nobody's been nomadic for a hundred years now, so having a traditional land base has changed. It's kind of like instead of being confined to the area, now they're just confined to the reserve more, instead of having the hunting and fishing grounds and stuff like that. So it's, people are a lot less prone to living off the land now than they used to. Depending on where they're from, if you go up to Fort Chip where it's isolated, a lot more people hunt and fish up there … where here you probably wouldn't see that as much. So it's, like dealing with the plants and stuff like that, you know, it's a little bit different for the guys in Mackay because there's so much work now. Like Mackay predominantly gets most of the work through the plants. They've got a lot of companies out there, they're doing really well for themselves. They've really got in tight with Syncrude. Really tight with Syncrude and they're doing really well there. So it's kind of like, things have changed a lot as to how many people still live off the land as much as they used to or even in comparison to people in Fort Chip, I don't know but I would say it's probably substantially less.
>
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> RC: I've seen it myself, change over the years. In the last thirty-five years,

> there's less and less, people are moving away from the forest. You wouldn't find too many trappers nowadays. Living off the land and that. Although we still try to maintain the food source because it's a healthy food for our Elders and Aboriginal people as a whole. It's healthy food. We try to maintain the food source with moose, deer, rabbits and fish. And we still believe that this is the best food there is to provide for the Aboriginal people.

The move away from relying on trapping and other subsistence methods has resulted in a change of diet. Residents spoke about the shift from 'country' or 'wild' food to store foods, and the resulting impacts on health.

> EM: Well the people were healthy, yeah, for they used to eat all that. But now some of them are kind of sick or something, they don't have our wild meat that we get, rabbits and chickens. … Some of the stuff I don't like to eat anyway. And my kids, too, they don't like to eat some of that. They been living with the wild stuff.

As a result of their increasing reliance on packaged foods, people are thought to be less healthy and suffering from new diseases.

> MV: Look at the rate of diabetes. Aboriginal people predominantly didn't have carbs. They only carbs they had, you know the odd wild rice and carrots and stuff like that, which they only get a couple seasons, or one season out of the year up here, right? Most reserves up here didn't have potatoes and stuff like that until they were introduced by the Europeans after first contact. … That's one of the reasons why diabetes is so high in Aboriginal communities, especially up here, that much of an influence of European cultures and the way people eat fast foods and stuff like that, it's definitely changed. Like even, with myself, like getting dry meat, dry fish and stuff like that is hard. … You know, they come down and they buy their groceries or whatever, and don't have to worry about preserving the food like they used to. The shelf life on a can of soup is exponential in comparison to, you know but it's a lot harder. Like people are a lot less healthy now than they used to be, like if you're looking at the Aboriginal communities.

Change manifests itself not only in subsistence strategies, but also in other ways that affect local cultures and worldviews.

> MV: Well, [Fort Mackay residents are] starting to flow into mainstream society more. I think it's a choice and I think it's also a bit of nudging on Syncrude's part. It's a fairly big carrot for a lot of the people out there [Fort Mackay]. They grew up having nothing and all of a sudden they're making a

> hundred and twenty thousand dollars a year, and driving a brand new truck and rebuilding their house, and it's kind of like, definitely the values are changing. They're living a lot more European lifestyle. European society lifestyle. So it's things like that, definitely a lot of changes on the go. Whether that's good or bad, that's not for me to say.

Another local resident is certain that the changes to local culture are negative. He expresses his sadness:

> RC: I think we need to get some educational system happening here relating to the boreal forest so there will be a continuance of understanding of our culture. And it's very, very sad, I mean it saddens me to see the younger generation not being motivated in understanding our culture and how their parents and their grandparents, forefathers, have been over the years in this land.

RC displays his concern for what will happen to the traditions he has known if the younger generation does not learn about and perpetuate them. He worries about the impact of change not only on the future generation, but about the impacts on the entire community. One of my key informants wondered what would happen after all the oil has been extracted and industry leaves the region:

> JA: And I'd say there's probably ten good years, they're going to leave a toxic mess, that's what I think, one day. And this boom thing can't go on forever. And what's it going to be like to live here? In the next twenty years when they get all these plants in operation, what will the cumulative effects be? I don't know. All I know is if I was a young person, they're going to have to improve because if they're going to expect people in the region to pay all the social costs and environmental costs with their health, and all the other workers who come from right across Canada and out of the country, and they make their money and they leave here, and we're left, what are we left with? What are we going to be left with?

Other residents also discussed change in relation to the community itself:

> RB: The town is growing and traffic's a lot harder. People aren't as friendly as what they used to be. I can remember when I was a kid, heck you leave your back door open nowadays and you know, everything's locked up tight, know what I mean? It's just growing. It's just growing.

Some residents focused on the negative changes, as RB show above, and some noted

more positive developments in Fort McMurray:

> SJ: I was twelve when I came here and there was nothing for us to do. Just things like you end up, you end up getting into more trouble as young people I think because there was no facilities, you had one small swimming pool, you didn't have parks, you just didn't have anything you could do. And now they've developed community around young families with children, right, there's more for them to do, more access to stuff.

Residents do not suggest that all changes are bad, rather some are quite happy to see new developments or improvements to infrastructure and services. Aside from demonstrating how risk, change and uncertainty are bound together, these comments from informants provide insight into how the region and its people have changed over the years and what concerns they have for the future. The next section will supply more detail on how residents view Fort McMurray today.

Conceptions of Fort McMurray

In Chapter 4, I introduced the history and contemporary conditions of Fort McMurray and the Regional Municipality of Wood Buffalo. In this section, I will provide some residents' perceptions of the town from the viewpoint that risk perceptions are influenced by place attachment (Douglas & Wildavsky 1982), and are therefore important to consider.

The region has been undergoing rapid change and development for the past thirty years, and new residents help to contribute to a regional identity. As one resident said:

> GK: There's all these different families or different cultures that are converging here in Fort McMurray.

Each newcomer and longtime resident has definite ideas about what Fort McMurray

is like. Caldwell, Zwerman and Olmsted (1979) provided an introduction to how the area has been perceived through time, and some of their ideas are represented in the interviews I conducted in 2004. Some residents tend to emphasize the negative views that Caldwell, Zwerman and Olmsted (1979) found in historical records:

> BT: It's either cold or hot, and if it's hot then the bugs are huge.
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> RF: Also up here what hurts, it's all muskeg. Muskeg and sand … we have about five hundred dollar extra costs because you have to build pilings because it is all muskeg.
>
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> KC: The land's very muskeggy, it's sinking and it's not very good.

Weather conditions tend to the extreme, insects are unwelcome, and the land itself poses problems for transportation, recreation, building and agriculture. Some residents, however, enjoy the opportunity to use boats on the river in summertime, take advantage of what hunting is available and make the best of winter by snowmobiling or cross-country skiing.

Himelfarb (1982) notes that one-industry towns are generally located far from regional centres. The location of this town in the northeast of the province, away from urban sprawl found in Alberta's other cities, allows for easier access to the wilderness and its potential for recreation; this isolation, however, can also be a difficulty:

> AA: I think that we're lacking [health resources] in Fort McMurray because we're so isolated from anything. You have to make do with what's here, or travel four hours and try and get an appointment.

Distance from major centres can be a problem, especially with the burgeoning

population increasing demand for services such as health care in a province already short on medical staff and facilities. As rural sociologist Freudenburg (1992) notes, the location of resource communities far from metropolitan centres often allows them little negotiating leverage, and makes it difficult to attract services and professionals who could find employment in larger cities. Infrastructure may also lag behind, largely because of a lack of workers. Residents speak of Fort McMurray as being in a perpetual housing crisis, and the large population residing in hotels and camps can attest to this reality. The population is expanding faster than planners can keep up with, and services and programs may suffer too:

> MV: I think there needs to be more infrastructure to get the people more active around here.

Himelfarb (1982) suggests that recreational activities in one-industry towns are highly organized, and many activities in Fort McMurray are. There are baseball leagues with rosters, schedules and fees to pay, classes to take at the YMCA, but they are not necessarily accessible by shift workers who may find themselves working the twelve or fourteen hours that facilities are operational. To help alleviate the health risks associated with inactivity, MV would like to see recreational facilities that reflect the needs of plant employees by being open at different hours, or drop-in leagues in addition to those that require a commitment to be available at a certain time each week.

While some people are quick to point out the problems they find with Fort McMurray, others mention things that they are pleased with. One interviewee told me how much he appreciates the generosity of others:

> EF: There's a lot of support for the homeless community. Because there's people with lots of money that donate stuff. There's a lot of people here that care, too. They don't want to see people on the street, no less than we want to see ourselves on the street. They just naturally like to help people I guess.

This homeless, unemployed young man focused on the positive aspects of Fort McMurray, rather than dwelling on perceived deficiencies, and thinks that people in this region are healthier than those in other small Alberta communities.

Some residents focus on comparing Fort McMurray to other places with which they are familiar, particularly the neighbouring province of British Columbia. They note that it is colder here, that there are fewer draws for tourism (RF: What's here, though? Compared to BC?), that people are not as environmentally conscious, or just that it is different:

> BT: I never realized quite how hippie-like I was until I moved up here. I was just a normal BCer until I moved here.

Experiences of living in this new town can help to emphasize personal qualities or aspects of identity that had perhaps not been as important before moving. BT, for example, worked at an imported food store, and preferred to buy organic food and avoid chemicals. Once she moved to Fort McMurray, she became more aware of her own tendencies toward 'hippieness' when faced with the contrasting habits of residents of this industrial town.

While residents offered a wide variety of perspectives on Fort McMurray, one description was more common than others: this is an industrial town. Fort McMurray is not a tourist destination, it is not a commercial or bureaucratic centre, it is no longer

a stopping point on a route north. When people or businesses move to the area, it is because of industry.

> BT: Fort McMurray is still, mentality-wise, very much an oil town. It's just an oil town. It's like if you were going to Tumbler Ridge, it's a mining town. This is an oil town.

While BT sees the differences between Fort McMurray and the majority of BC, she draws a comparison between her new home and Tumbler Ridge, BC, a town dependent on mining just as McMurray is on oil and gas. Many residents were quick to assert that they only moved to the region for industry, that there are few if any other reasons to move to this industry-dependent town. To most, Fort McMurray exists for oil sands development, and is defined by its industrial character.

This discussion of how people perceive the town in which they live is important in that peoples' ideas about place affect how they live in that place. As Casey notes, cultures exist in a particular place, and places help to constitute cultures (Casey 1996). Since this study focuses on a cultural and social perspective on risk perception, an understanding of how people perceive the physical, cultural and historical place they inhabit is important. In the next section, we will see how residents envision place attachment as affecting attitudes and actions toward the community.

Outsiders

Risk perception is based in part on place attachment; I have examined residents' conceptions of the place where they live, and will now look at their ideas about those people who do not display particularly strong attachment to the community of Fort

McMurray. In examining ideas of place, philosopher Edward S. Casey says that "lived bodies belong to places and help to constitute them...places belong to lived bodies and depend on them" (1996:24). Such an idea can help to inform how people's experiences of place inform their ideas of healthy bodies and healthy environments, and what maintains or threatens that health. People are informed about their world through their bodily interactions with it; an ongoing process, continued interactions will contribute to further development of ideas about place and perceptions of risk. Questions arise, then: how do those individuals who have been 'lived bodies' in a community for a long time relate to those who are new inhabitants? Does it take time for a body to belong to a place? How does a place belong to and depend on new lived bodies? Fort McMurray provides a context for such investigation, in that it has a population of longtime residents who feel proprietary about their community but who are being numerically overwhelmed by incoming workers. This section shows that the home-owning residents who think of Fort McMurray as their home blame the transient population for problems in the community. Longtime residents express concern that temporary workers do not care for Fort McMurray appropriately, that they are not invested in the wellbeing of the community and environment and therefore treat the region with little respect.

One newer resident of Fort McMurray presents a question that is commonly asked of newcomers:

> GK: My motivation, what is it? You have to have a reason to be in Fort McMurray. People say 'where are you from?' Anyway, that question comes up a lot here, where are you from. Really what they're saying is 'why are you here?'

A local worker who has been in town for twenty-eight years has the answer:

> SJ: They're just there for a paycheque.

This motivation is common; essentially the only reason for moving to this isolated industrial town is for work. People from all over the country, and sometimes from other countries, move to Fort McMurray seeking professional and economic advancement. A young woman who thinks of Fort McMurray as her home, despite having lived in several other countries while she was growing up, agrees that people who do not consider Fort McMurray to be their home treat it poorly and contribute to environmental risks. She feels that transient workers do not think of Fort McMurray as their home:

> SW: It's almost like a steppingstone for many people. Because you find that the majority of the population is Newfoundlanders. So they're all just here for work. And for them, 'back home' is always 'back home.' And then this is sort of just a place where they can earn some money or get some schooling or get into a degree or something or other and it's, it's like a middle place, a middle ground for, you know, to go up elsewhere. So Fort McMurray's never really home unless you're really born and brought up here.

References to Newfoundlanders were not uncommon in my conversations with Fort McMurray residents. The town is known to have a significant population of workers who have left difficult economic situations in Atlantic Canada to seek more gainful employment in the oil sands; this is a popular conception both in Fort McMurray and in other regions of Alberta. Within Wood Buffalo, some longtime residents can become resentful of the eastern newcomers, perceiving that they are taking jobs from locals who need them more:

> JA: There's more people right now from Newfoundland working in the plants than there are local people. Bottom line. That's the truth. … they've got more low skilled workers from Newfoundland who are getting jobs at that plant.

> And it's not fair. There's a lot of resentment in the area but it's being kept under.

Born and raised in Fort McMurray, JA is unhappy that low skilled jobs are given to Newfoundlanders instead of local Aboriginals. She sees the situation as unfair, and something that the oil sands companies could remedy if they so chose—since they do not, her dislike and distrust of the industry increases. Other residents were perhaps not as upset with the influx of easterners; some, rather, were just not sure about them:

> RC: You have increased population, you have all kinds of people, different sorts of people coming into this region, you don't know who they are, where they come from, what they do, what sort of personality they have.

Without knowing about a person's history, family, their personality, it is difficult to know just how to think about and interact with them, says RC, another longtime resident of Fort McMurray. It is hard to know these newcomers, especially when they do not involve themselves in the community:

> SJ: I like to give to the community also, right, because I am from here, my children have been raised here, they're still living here and actually seeking employment here now. Yeah, you have a different look at it. Especially when people that come up here just for work end up staying in camp and so don't even deal with the community most of the time.

For SJ, who is "from here," involvement with the community is important. In his view, it demonstrates that he cares for the place that he *lives* rather than *stays*, "staying" envisioned as a form of habitation associated with camp dwellers. SJ saw a distinction between those who have homes in the city, whose activities take place in the city and cultivate a relationship with it, and those who are temporarily staying in work camps and impact the town without contributing positively to it. His sentiments were echoed by JA:

> JA: A lot of people don't live here. So they can come here and work and move

> away. So they don't really care. There's a lot of people that know that these are not healthy places, there are oil sands workers coming from right across Canada, out of the country. McMurray is just a boom town and there's an attitude even in terms of the environment, McMurray's probably got more garbage thrown around. People use this place as a, the majority of workers come in from elsewhere and treat it like a dump.

Outsiders who are new to the community do not treat it well, says JA. They litter and do not exhibit concern for the environment, thus constituting a risk to environmental health. Other residents also perceived outsiders as not caring for Fort McMurray, not appreciating it or taking pride in it:

> AA: This is home, and I think Fort McMurray is a beautiful area, and you don't get a lot of that from people that are here to make money and leave. Fort McMurray itself is a very dirty city, you might have noticed. And that's because nobody takes ownership. You know and that's the difference is nobody, nobody cares, that they get this 'I'm not retiring here anyway' attitude.

Even people who have not lived their whole lives in the community but are relatively recent arrivals hold the opinion that for many, Fort McMurray is not home.

> BT: It's not their home. And if it's, until it's your home, you're not going to take care of it.

Outsiders are seen as having no sense of attachment to their temporary stopping point, of being committed to money rather than community and its health:

> DD: They're just transient. They come up here and make their money and leave.

These residents' statements illustrate the local idea that people only move to Fort McMurray to make money; they stay for a short time, form little attachment to the community and likely cause more harm than good, then return to their 'homes.' The question, then, is how do such conceptions relate to perceptions of risk? I suggest that because outsiders are perceived to have little connection to the community and

environment, they are thought of as careless folk whose actions threaten established ways of living. Outsiders bring environmentally damaging industrial development; the oil sands have been commercially exploited by those from further south, not the hunters and trappers who helped to originally establish the community. Outsiders bring change and uncertainty. As previously mentioned, the categories I present in this chapter are not bounded, but rather connected to each other to help inform nuanced perceptions of health and environmental risk. Longtime residents associate outsiders with social problems, often seeing them as the root of problems with drugs, alcohol and other risks to cohesion within family and community. An understanding of risk perception includes investigation of those individuals, groups and institutions thought of as causing risk. The 'other,' in this case the population of newcomers to town, is a concept easily marked as bringing harmful change. Of course, residents do not attribute *all* risks to outsiders, but they are certainly seen as one of the sources of potential negative change.

Knowing risks

Having examined ideas toward institutions, home, change and outsiders and the connections these ideas have with risk perceptions, I will now look at how people recognize and know risks. Knowing risks is more complicated than simply paying attention to media reports or school lessons. Bush et al (2001) remind us that knowledge about risk is a complex process: "the public doesn't assimilate scientific information in a passive way, but the social validation and legitimization of expert information is actively negotiated in relation to a range of resources, including

experiential and local knowledge" (2001:215). As I have mentioned previously, Douglas (1985) and Douglas and Wildavsky (1982) note that there are too many possible risks for people to be able to pay attention to all of them, and knowledge about risks is incomplete: "no one knows it all" (Douglas & Wildavsky 1982:3). Rather than examining whether residents' perceptions of risk and their knowledge of specific risks is "right" or "wrong" according to experts' information, this section looks at the ways in which people understand risks. Respondents in Fort McMurray noted a number of different ways by which people know the risks they face; included here are examples of informants' views and how they relate to social science literature on perceiving risks.

Although not the only, or necessarily primary, means by which people know risks, science is one method through which risks become known. In the context of environmental protection regulations, scientific methods are often employed in the Athabasca oil sands region to test levels of pollutants in water, air, even in humans themselves (see, for example, Golder Associates' 1996 examination of the Suncor reclamation area's performance, Health Surveillance's 2000 summary of community exposure and health effects in the Alberta oil sands, or Westworth Brusnyk & Associates' 1996 bird species count on the Suncor lease). Despite the prevalence of scientific investigation in the area, not all residents trust completely in the findings. In keeping with Beck's (1999) idea that in the risk society, people do not have faith in experts, some residents expressed distrust in scientists. Even though science is incompletely or selectively incorporated, people may use a scientistic framework to

project risk into the future. One worker suggested that science takes time to know about risks, and was concerned that the impact accumulated over time may not be knowable yet:

> SJ: They're saying that the allowable limits aren't, like there's a threshold for all of these chemicals and everything, and they're saying they don't exceed the thresholds, but I mean that's science that, it takes thirty years to prove sometimes how it affects you. I know that it affects people, but I don't know how detrimental it is over a twenty-year period.

Another worker agrees with this sentiment, noting that regulations have changed over the years, a trend that suggests the fallibility of scientific understandings:

> DD: There's a lot of things that are catching up on us. You have chemicals that twenty years ago you could have washed your hands with, and today they're telling you it's cancer causing. … I don't think we know what the risks are yet.

We don't know the risks, agree Douglas and Wildavsky (1982), but for the sake of our mental health, we need to act as if we do. Some degree of confidence in our daily activities and the mechanisms in place to protect us is requisite for healthy functioning. Brown (1987) has suggested that people may ignore certain work-related risks in order to reduce anxiety, and has also noted that only a small percentage of chemicals used by industry have been tested by the United States' Environmental Protection Agency for chronic effects—certainly there is information available to plant workers through their union stewards and the Workplace Hazardous Materials Information System in Canada, but many products are new enough that science has not yet had time to thoroughly examine long-term effects. It is difficult for workers, then, to make decisions about what is safe and what is not:

> SJ: So who do you listen to? I mean the government says they're watching them, then you get a scientist come up here and say, "No, no no, they're wrecking this planet." You know what I mean? Two different ends of the

spectrum.

Beck (1999) suggests that in addition to not being able to trust in experts who should be able to ascertain levels of risk, people cannot trust in their own senses to detect pollution or risks posed by industry. One worker agrees:

> DD: The things that are bothering a lot of people, you can't see visually, like the gases and stuff like that.

To him, the risks that are created by industry cannot be seen, similar to Beck's (1987) example of human senses being disempowered by their inability to detect threats from radioactive materials. Lay people cannot know about risks in the same way that experts are supposedly able to. A cultural tension emerges here where expert knowledge, that of science, is more authoritative than lived experience and the senses.

Not all residents agree with the idea that today's risks are unfelt by the human body. A man who drives buses and taxi cabs to and from plant sites related this anecdote about smelling pollutants and seeing their effects manifested in the form of astounding sunsets:

> GK: Man, the beautiful sunsets and the skies that I see here in Fort McMurray … some of the residue from the oil and gas extraction that is making these spectacular sunsets here, these red, like they look kind of other-worldly in a way. So again, what's going into the air? There are times when I've driven out to Syncrude, and just dropped guys off at the plant, forty-five minute drive to the first plant Suncor and then to Syncrude, but there'll be this stink in the air. It only happens when the air is not atmospherically ventilated as it should, but these guys will get in the cab, and the stink will be in the cab, and it only happens three or four times a year, but sometimes it will settle over the city and it won't go.

This man certainly believes that his body is able to know pollutants, contradicting Beck's claim. Certainly some risks are undetectable without specialized techniques

and instruments, but we can all attest to being able to smell automobile exhaust, and residents of rural Alberta are not unfamiliar with the "rotten egg" smell of gas flares. While engaging in everyday activities, residents encounter risks through their bodies.

Phenomenological perspectives suggest that perceptions are based on our engagement with the world and on our past experiences. To illustrate phenomenology's focus on living in the world as the basis for perceptions, I draw on Merleau-Ponty's (1962:viii) citation:

> I cannot shut myself up within the realm of science. All my knowledge of the world, even my scientific knowledge, is gained from my own particular point of view, or from some experience of the world without which the symbols of science would be meaningless.

Some people are more comfortable knowing the world through their actions rather than through scientific calculations:

> RC: I've gone to school, I've studied science a number of years in high school and that, but at the same token, I also studied my traditional knowledge from Elders. And I always fall back on my traditional knowledge because I know it's for real. Unlike the scientific world, it's all measurement.

For RC, what he learns from his Elders is more important to him than what he learns through science in formal education. Arquette et al (2002) note that environmental impact assessment testimony from Aboriginals is often discounted because it is not considered "scientific"; accordingly, for this resident, science is not the only way of knowing. His own experience and history, and that of his Elders, guide him; his identity is tied into his ways of knowing.

> RC: We are the boreal forest Aboriginal people, and we know what's out there, from generation to generation. And that's how we lived for years, many, many years.

Another Aboriginal man made reference to his experiences as informing his knowledge of risk.

> SM: I worked around these oil sands plants since 1965 so I know what's going on.

This man's knowledge of risk is informed not by engagements with traditional activities or oral histories, but by his familiarity with what goes on at the job site. He does not rely on science to tell him what is risky, but instead on the things that he has seen, felt and heard on site. This kind of knowing is certainly not restricted to Aboriginal Peoples; other workers also made references to their jobs as providing opportunities to see smoke and flares and thereby become aware of risks. As Ingold (1992) notes, life is experienced through practical engagement with the world, and our perceptions of the world and its risks are the result of our actions.

Although Ingold emphasizes that we do not live in constructed worlds, that perceptions occur immediately, and we do not exist in "contemplative detachment," (Ingold 1992:44), this is not to say that people never make observations and reflect upon them consciously. Certainly, people think about issues that concern them, and make new decisions about things that they have observed. In a discussion of whether or not it is risky to live in Fort McMurray, one worker offered the following observation after noting that he cannot 'prove' impacts to health:

> SJ: I know that a lot of people suffer ill effects after retirement from this place. I don't know the actual stats, that's why I say, when I start talking about this stuff it's really hard, because I don't want to say stuff that I don't know, but I do know and have heard of a lot of people that don't make it very far past retirement.

For SJ, the observation that people do not live long after retiring from industrial jobs in the oil sands led to the conclusion that their occupations in industry are harmful to their health. This way of knowing, of seeing something, reflecting upon it and coming to a conclusion, is evident in my study. This is not a perception based on scientific reports, nor is it necessarily directly related to how this worker engages with the world; it is rather, an idea arrived at through conscious thought.

Just as the specific risks the residents perceive vary, so too do their ways of knowing about risks. This summary of ways of knowing risks should not be considered exhaustive; certainly there may be many more such ways that did not emerge in conversations in this study. It is important to note, though, that there are many ways of knowing, that there is controversy over whose way of knowing is right, and what sort of knowledge is correct.

Who worries

Some residents made comments about who worries about risks, and who does not. Not all residents held the same opinions on this matter, and ideas about who is concerned about risk varied. Some suggested that those with families are more concerned about potential harms to health and environment:

> GK: I'd say the moms, mothers of young children, the sense that they have more of a concern than – I'm not saying there isn't a lot of blue collar women in town that are also, but you know, that's a concern. The family. Maybe even not so much them but more so for the kids.

Covello (1985) suggests that concern for future generations is a factor influencing risk perception. If a risk is seen to possibly affect children, grandchildren or even

subsequent generations, some people may select that risk as one for concern. It makes sense, then, that mothers would be concerned for the health and wellbeing of their children. BT, for example, worried about air quality because of its effect on her children's asthma, and her husband worried about tainted snowflakes carrying pollutants to his children's awaiting tongues.

Another suggestion regarding who worries about risks was that people only worry when they are directly affected, when they experience physical symptoms of impact. Said one plant worker:

> RF: I think most people don't care as long as you can breathe.

We cannot worry about every possible risk; there simply is not time to do so and remain a healthy, functioning individual. Risks are selected (Douglas & Wildavsky 1982), and so this worker suggests that people do not worry about risks unless they can feel the harmful effects. Otherwise, why worry?

Likewise, one resident expressed the sentiment that people in Fort McMurray are too involved in their jobs and families to worry about environmental risks, either now or in the future. An unemployed, homeless man who moved to the region from British Columbia one year previous to the interview had this to say:

> EF: People here wouldn't care about it. They don't care. They're killing the environment just go going to work every day at Syncrude. And you're contributing to greenhouse effect or whatever it's called. …Eventually everything's going to turn to shit but nobody sees it like that. … Go to work, come home, eat supper, watch TV with the kids. All that kind of shit. They're not too worried about what's going to happen 150 years from now. Wondering whether or not they helped contribute to the death of this planet. A lot of people don't see it that way, but there's a few that do. And then there's

> some that just don't really give a shit. Because they're going to be dead before that time comes anyway.

He agrees that if people aren't directly affected, they will not be concerned about risks. He does not consider that these workers may worry about the effects to future generations, as Covello (1985) and Slovic (1986) suggest. In EF's view, the daily tasks of living obscure thoughts of the distant future and potential impacts for most people.

Although the insights offered by these residents can certainly apply to some people, data from my interviews suggest that these ideas are perhaps a bit generalized. For example, not all mothers that I interviewed were concerned about their children's health being impacted, nor did all plant employees ignore the effects their industry may have on the environment or their own bodies. Risk perception is certainly more multi-faceted, as this discussion shows.

Action (what to do about risks)

Some people do not worry about risks to environment and health in Fort McMurray, and some do; some extend that concern to action. When discussing perceived risks, residents would occasionally want to discuss potential solutions to the problems they saw. In keeping with my approach of allowing interviewees to discuss what they felt was important, I encouraged the topic of action with some. This section will address a few residents' views of what barriers there are to action, what tactics are or could be effective, and what concessions can or have been made. It will incorporate theoretical perspectives on risk acceptability and control.

Some residents in Fort McMurray felt that they had little or no ability to effect change in relation to local environmental or health risks. Longtime resident JA saw residents as powerless in the face of the multinational corporations that she felt made decisions about the industry that has so much effect on her town:

> JA: Decisions, multinational corporations are making decisions about our lives. I think a lot of those decisions are made in board offices, are made somewhere else. But people here feel almost, I think kind of helpless. … If workers speak up about their health, or about discrimination, they say it's not happening. And they're taking care of it. They're not.

Her skepticism about industry and decision makers relates to Douglas and Wildavsky's (1982) assertion that in this age of environmental concern, big business has emerged as the enemy in the West.

Outrage over risk does not necessarily lead to action, as my respondents tell me. They say that aside from feelings of helplessness, they worry about possible retribution on the part of their employers should they raise concerns. JA shared an example of a friend losing his job:

> JA: Oh yes, they would be [at risk of losing employment]. Because if it ever gets out, is one thing. One guy, a friend of mine she's Blackfoot and her husband was Chipewyan from Fort Chip First Nations and he spoke up vocally. He got let go. … You cannot comment in this community without repercussions. It's the same as working for the government and badmouthing your employer. You will be gone. … They're very careful in this town. If you do anything like that there are repercussions. They wield a lot of power, a lot of times you will be blackballed.

Workers in plants are also aware of the potential for workplace problems resulting from voicing concerns about environmental health risks:

> SJ: I've been in this business for twenty-five years, and if I want to jump up

> and down and shut them down, then I don't have a business. I don't have a living, right? …I just talked to a guy last night that, to him, he should have action from the government today because of the emissions. He's a process operator. He knows what's going in the air…so he's more concerned than I am. You know, and he told me last night, these guys are breaking the laws left, right and centre. And he gets very upset, but at the same time, he brings up too much at work. And they started pushing him down because of it. So you can only go so far with your concerns.

A union member, SJ realized that although there are possible repercussions, residents also envision solutions; there are those who are willing to "fight" industry in an attempt to mitigate risks. He brought up the town of Fort Mackay, surrounded by oil sands developments, framing their actions as "fighting:"

> SJ: I believe, like the Fort Mackay band for instance, they're seeing the water systems devastated. The fishing industry, air quality, they have to deal with all of it. There's fallout in their community, there's all kinds of things going on. And I believe that they're, they've been fighting it year after year. Like they, it's a continual fight out there. … It's a constant battle. Like I say, the government approves these places, so instantly you're fighting big corporation and governments and everything else.

While some suggested battling with the corporations seen as creating risks, others preferred to work with them to find solutions. RC, local activist and political figure, wanted to find a way to incorporate Aboriginal viewpoints into industry practices:

> RC: There's nothing better than merging the scientific and the Aboriginal knowledge together. And working together, and understanding one another.

For him, risks could be decreased without the drama of fights and battles, but through understanding and education:

> RC: I think we need to get more public education happening when it comes to environment. We need to get more pubic involved in the environmental concerns. We need to get more public awareness.

He felt that if the public at large became more aware of environmental and health issues, they would be better able to recognize and mitigate risks under their own

control and could work together to lobby industry and government to develop regulations and procedures to reduce risks perceived by the public. There is certainly an idea in Fort McMurray that industry is doing what it can to impact the environment as little as possible and protect its workers as best it can. Appropriate personal protective equipment (PPE) is of course provided to employees, and JA noted previously in this chapter that plants are held to stricter environmental regulations now than they were in the early days of oil sands development. The Province of Alberta, despite its opposition to the Kyoto Protocol, does wish to reduce the levels of contaminants released in extraction and processing, and industries realize that having the support of the community and keeping workers safe and healthy is good for business; one worker noted his approval of Suncor's move to focus on safety rather than production levels, and others said that they felt quite safe working in and around the plants. This satisfaction with risk-reduction measures and a feeling of confidence in industry brings us to a discussion of how some residents perceived not only risk, but also safety.

Perceptions of safety

Before concluding this discussion section, it is necessary to point out that not all residents are concerned about industrial risks to health and environment. Douglas and Wildavsky (1982) note that when people select certain risks for attention, they are at the same time *not* selecting others. Different people and different groups will be willing to accept different levels of risk: "acceptable risk is a matter of judgment, and nowadays judgments differ" (194). While some interviewees made note of risks of

cancer, lupus, asthma and poor water quality, others felt that industry was doing a fine job protecting the environment and residents as best it could, and they felt fairly safe. Respondents who were not very concerned about local risks tended not to report any ill effects on their own health; perhaps, as respondent EF suggested above, if people are not directly affected, if they do not experience somatic manifestations of risk, they will not be concerned. Such was the case in a study of a New York community whose drinking water had been contaminated by a carcinogen (Fitchen, Heath and Fessenden-Raden 1987.) Residents did not experience any symptoms, and were already familiar with the chemical through employment in the local factory, and were not concerned about potential risk; rather, they were put out by the task of boiling water before cooking or drinking. Familiarity with pollutants can help to alleviate concerns about inherent risk, as the New York case study shows. Social Amplification of Risk Framework scholars also note that familiarity is one factor in risk perception (Covello 1985; Covello and Johnson 1987; Kasperson et al 1988). Another possible reason why risks are not selected involves avoiding anxiety; Brown (1987) suggests that people may deny risks that they cannot control in order to reduce worry. Perhaps workers in Fort McMurray who say that they feel safe in their jobs are making such statements because they do not want to acknowledge potential dangers. Perhaps they are not attached to the local surroundings and simply do not care about the community enough to acknowledge potential harms. Whatever the motivation, it is important to note that many residents of Fort McMurray are not significantly concerned about risk, that although there are those who worry very much about air pollution and social wellbeing, it is not a community composed solely of very scared

individuals. Risks are selected, and some are not; some people envision themselves as safer than others.

Where to draw the line?

Many individuals I spoke with acknowledged both potential harms and potential benefits. For them, the question was how to balance the enormous economic returns for individuals and greater communities with the known environmental harms and the potential for even greater degradation.

> SJ: I see enough damage to the environment out there that it makes me wonder. But at the same time, where do you stop progress, right? I mean I go to work at the oil sands plants every day, I'm not about to shut them down over environmental issues. I do see devastation. It's obvious it's going to happen in an open pit mine, but like I say, where do you draw the line?

Defying stereotypes, Fort McMurray is home to many thoughtful individuals who are well aware of both the concerns of environmentalists and the necessities of making a living.

> DD: Probably a lot of people are concerned about [the environment], but the thing is, this is how they generate their wages. It's one of those catch 22s. Everybody's an environmentalist to some extent, I mean if you don't have an environment, we're not here either. But at the same token, if you're not making money, you're not.

These and other individuals were interested in finding balance, in mitigating harms while maintaining benefits. The sentiment is echoed in the public face of local companies as well; the Suncor and Syncrude websites both express motivation to benefit individuals, local communities and the provincial and federal budgets while having as little negative impact on health and environment as possible. The question of how to do so and what amount of impact is acceptable in exchange for economic

gain is at the heart of debates about risk.

Summary

The study of risk perception involves much more than simply identifying what specific risks are of concern. To better understand risk perceptions, we need to look at the social and cultural contexts in which they are embedded; Dake notes that "worldviews provide powerful cultural lenses, magnifying one danger, obscuring another threat" (1992:33). Through discussion of such broad concepts as government, industry, environment, economy and place and their relation to ideas about risk, I have been able to provide a more richly detailed account of health and environmental risk perceptions in Fort McMurray than had I conducted a survey asking residents to rate their level of concern about particular risks. In combination with Chapter 5, which introduced the specific risks that residents were concerned about, the segments of interviews I have presented in this chapter allow for in-depth consideration and more vibrant illustration of the variety of worldviews and personal experiences that help to inform the multiple perspectives on risk found in the Athabasca oil sands region. Sociological factors are limited in their power to predict and describe perception; the phenomenological perspective offers more comprehensive and intuitive theoretical grounds for understanding the complex processes of health risk perception.

Chapter 7: Conclusion

Approaching health risk perception from an anthropological and phenomenological perspective afforded me an understanding of residents' concerns not accessible by more mechanized psychometric and sociological methods. Health risk perception is a complex process that is best understood by investigating the contexts in which it occurs, by developing a humanistic appreciation for the manner in which perceptions are created and maintained. Models, charts and diagrams do not adequately convey the complexities inherent in perceptions of health and environmental risks.

Throughout the research and writing of this thesis, I have attempted to maintain a focus on qualitative analysis. After introducing the dominant literature in the field of health risk perception, in Chapter 2, I noted my preference for holistic, cultural approaches like that of Douglas and Wildavsky (1982) over the more mechanistic sociological and psychological models of Ulrich Beck (1987; 1992; 1996; 1999) and Vincent Covello (1985; Covello and Johnson 1987; Covello and Merkhofer 1993). In my view, the words and experiences of people allow for a more comprehensive understanding of an issue than numbers and graphs.

I described my methodological approach in Chapter 3, again preferring the anthropological approach of favouring everyday discourse to the reductionist surveys and statistics used in psychometric analyses of health risk perception. I maintain that one can learn about the everyday experience of health risk perception best by examining the broader social, political, cultural and economic worlds of the people

with whom we wish to become more familiar. I gave details about the local setting in Chapter 4 in order to help the reader situate the study in the specific contexts of Fort McMurray, Alberta. The unique social and economic circumstances in Fort McMurray lend themselves to a qualitative approach that can account for the diversity of backgrounds represented.

Findings were grouped thematically and divided into two chapters: Chapter 5 detailed the specific bodily and environmental health risks that residents perceive, while Chapter 6 situated these concerns in the context of health perceived as a mental and social state in addition to physical realities.

Collectively, this thesis demonstrates that, in my research, the cultural approach that Douglas and Wildavsky (1982) developed to situate the observation that different people worry about different risks was most fruitful. Various residents of Fort McMurray and surrounding communities expressed concern about diverse personal and environmental health risks: cancer, lupus, asthma, poor air and water quality, fish and animal health, skin diseases and acid rain were all represented in my interviews and more casual conversations. By extending my research beyond simple investigation of what risks residents perceive, I learned that just as the discrete categories of individuals or groups (such as 'industry workers' or 'Aboriginals') that I had anticipated finding were not so discrete after all, health risk perceptions cannot be classified into distinct and separate headings. Instead, specific perceptions are interconnected and reflect particular ways of being in the world, of interacting with

one's surroundings and circumstances. Just as health risk is not easily contained, the people I spoke with presented different ideas about what constituted the term 'health.' For them, health is generally about more than just physical states of bodies and environments: it refers to the mental state of individuals, the stability of families and social networks, and the wellbeing of a community as a whole. Their conceptions of health were idiosyncratic and nuanced, as were the health risks they perceived. For residents of Fort McMurray, risks to health and environment were of concern, but they were also troubled by negative social impacts, such as crime, violence, substance abuse, and family stress they attributed to the presence of industry. Such findings lead me to the conclusion that the cultural approach I brought to my project facilitated a more comprehensive understanding of health and health risk perception than a quantitative survey would have allowed for.

In this community based on petroleum extraction and refining, the oil and gas industry plays an important role in residents' perceptions of health and environmental risks. Its inescapable presence dominates the character of Fort McMurray and is central in the everyday lives of its inhabitants. During the planning stages of my fieldwork, I hoped to learn whether oil and gas had an effect on risk perception, and suspected that it would be important in this industry-laden region. My research proved that initial conjecture true. Most residents that I spoke to admitted to an economic reliance on the oil sands, whether through short-term casual labour or professional positions with the major oil companies themselves, or through the capital brought in through associated commercial, residential and infrastructure development.

While a very few individuals would prefer to see Fort McMurray untouched by industry, the majority of my interviewees indicated a desire for balance between industrial and economic development and a responsibility to maintain health environmental and social conditions. My small sample suggests that those individuals who are more closely connected with the plants, for example those working on site, have a more positive outlook on environmental impacts than those who make their livelihood outside of the mine sites and processing facilities. This idea would require further in-depth research to be reliable, but could be an interesting hypothesis for another project.

It is difficult to produce generalizing statements about health risk perception from this study beyond the idea that there is considerable complexity about what constitutes health and health risk in this particular environment. What I have provided is an account of some people's perceptions in a particular time period, and I do not suggest that my respondents have provided me with exhaustive information about Fort McMurray and what its inhabitants think and do. Rather, I learned through my fieldwork about what a small portion of the population felt in the summer of 2004. Certainly other residents would have offered different information, and the same residents may have discussed different matters in another year, another month, or even later on in the day. I gathered my information under particular contexts, and I acknowledge that those situations may have had various influences on what my informants shared with me.

Limitations of this research include the number of semi-structured interviews and the time spent in the community doing participant observation. Had funding allowed for a more extended field season, I would have gained greater insight into the community and its inhabitants, and had opportunity to conduct more interviews and thereby learn more about health risk perceptions. Further research on this topic would benefit from a lengthier stay in Fort McMurray, affording the researcher more ethnographic detail on the lives and experiences of residents. Deeper analysis into what asserted risk perceptions reflect about what it means to live in Fort McMurray would be of value, as would a multi-sited investigation situating Alberta oil sands developments in the context of northern industrial development. Another emerging topic of great interest could be Aboriginal discourse on cancer and its etiology.

To understand how health risks are perceived, we must first understand how the people we are learning about conceptualize health. As medical anthropologists maintain, 'health' is not just a physical state dependent on the presence or absence of disease; rather, it incorporates ideas about healthy minds, healthy hearts, healthy communities, healthy relationships, healthy environments. Different individuals in different groups will have different ideas about what it means to be in a state of good health. Health risk perception, therefore, is a complexly situated social, cultural, moral, economic and political phenomenon and must be examined as such. The diversity of the population in Fort McMurray supports a wide variety of risk perceptions, each resting in the foundation of particular lived experiences. Residents' concerns about risks to health and environment extend not only to physical and bodily

states, but also to the social wellbeing of individuals, families and the community as a whole. This thesis endorses the examination of health risk perception from a holistic rather than particularistic perspective, an approach that facilitates meaningful access to the lived worlds of the people about whom we wish to learn.

Bibliography

Alberta Finance. 2004. Alberta Provincial Electoral Profiles-2004 Profiles.

Alberta Municipal Affairs, Municipal Services Branch. 2005. 2005 Official Population List.

Arquette, Mary, Maxine Cole, Katsi Cook, Brenda LaFrance, Margaret Peters, James Ransom, Elvera Sargent, Vivian Smoke, and Arlene Stairs. 2002. Holistic Risk-Based Environmental Decision Making: A Native Perspective. Environmental Health Perspectives 110(Supplement 2):259-264.

Basso, Keith H. 1996. Wisdom Sits in Places: Notes on a Western Apache Landscape. In: Senses of Place. Eds Feld, Steven and Keith H. Basso. Pp. 53-90. Santa Fe: School of American Research Press.

Baxter, Jamie, John Eyles, Susan Elliott. 1999. 'Something Happened': The Relevance of the *Risk Society* for Describing the Siting Process for a Mechanical Landfill. Geografiska Annaler 81B(2):91-109.

Beck, Ulrich. 1987. The Anthropological Shock: Chernobyl and the Contours of the Risk Society. Berkeley Journal of Sociology 32:153-165.

Beck, Ulrich. 1992. Risk Society: Towards a New Modernity. London: Sage Publications.

Beck, Ulrich. 1996. Risk Society and the Provident State. In Risk, Environment and Modernity: Towards a New Ecology. Eds Lash, Scott, Bronislaw Szerszynski and Brian Wynne. Pp. 27-43. London: Sage Publications.

Beck, Ulrich. 1999. World Risk Society. Cambridge: Polity Press.

Beck-Gernsheim, Elisabeth. 2000. Health and Responsibility: From Social Change to Technological Change and Vice Versa. In The Risk Society and Beyond: Critical Issues for Social Theory. Eds Adam, Barbara, Ulrich Beck, Joost van Loon. Pp. 122-135. London: Sage Publications.

Boeije, Hennie R., A. Cecile, J.W. Janssens. 2004. 'It might happen or it might not': how Patients with multiple sclerosis explain their perception of prognostic risk. Social Science & Medicine 59(4):861-868.

BOVAR Environmental. 1996. Sources of Atmospheric Emissions in the Athabasca Oil Sands Region. Report prepared fro Suncor Inc., Oil Sands Group and Syncrude Canada Ltd.

Brown, Michael S. 1987. Communicating Information about Workplace Hazards:

Effects on Worker Atttitudes Toward Risks. In the Social and Cultural Construction of Risk: Essays on Risk Selection and Perception. Eds. Johnson, Branden B. and Vincent T. Covello. Pp. 251-274. Dordrecht: D. Reidel Publishing Company.

Bush, Judith, Suzanne Moffatt and Christine E. Dunn. 2001. Keeping the public informed? Public negotiation of air quality information. Public Understanding of Science 10(2):213-229/

Caldwell, C.J., W.L. Zwerman and A.D. Olmsted. 1979. Perception of the Fort McMurray Environment Through Time. Calgary: Kananaskis Centre for Environmental Research, University of Calgary.

Casey, Edward S. 1996. How to Get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena. In: Senses of Place. Eds. Feld, Steven and Keith Basso. Pp. 13-52. Santa Fe: School of American Research Press.

Cronon, William. 1995. The Trouble with Wilderness; or, Getting Back to the Wrong Nature. In Uncommon Ground: Toward Reinventing Nature. Ed. Cronon, William. Pp. 69-90. New York: W.W. Norton and Company.

Cooper, Glinda S., Mary Anne Dooley, Edward L. Treadwell, E. William St. Clair, Christine G. Parks and Gary S. Gilkeson. 1998. Hormonal, environmental and infectious risk factors for developing systemic lupus erythematosus. Arthritis & Rheumatism 41(10):1714-1724.

Covello, Vincent T. 1985. Social and Behavioral Research on Risk: Uses in Risk Management Decisionmaking. In Environmental Impact Assessment, Technology Assessment, and Risk Analysis: Contributions from the Psychological and Decision Sciences. Eds. Covello, Vincent T., Jeryl L. Mumpower and Pieter J.M. Stallen. Pp. 1-14. Berlin: Springer-Verlag.

Covello, Vincent T. and Branden B. Johnson. 1987. The social and cultural construction of risk: Issues, methods, and case studies. In The Social and Cultural Construction of Risk: Essays on Risk Selection and Perception. Eds. Johnson, Branden B. and Vincent T. Covello. Pp. Vii-xiii. Dordrecht: D. Reidel Publishing Company.

Covello, Vincent T. and Miley W. Merkhofer. 1993. Risk Assessment Methods: Approaches for Assessing Health and Environmental Risks. New York: Plenum Press.

Dake, Karl. 1992. Myths of Nature: Culture and the Social Construction of Risk. Journal of Social Issues 48(4):21-37.

Douglas, Mary. 1985. Risk Acceptability According to the Social Sciences. New

York: Russell Sage Foundation.

Douglas, Mary. 1990. Risk as a Forensic Resource. Daedalus 119(4):1-16.

Douglas, Mary and Aaron Wildavsky. 1982. Risk and Culture: an Essay on the Selection of Technological and Environmental Dangers. Berkeley: University of California Press.

Ferguson, Barry Glen. 1985. Athabasca Oil Sands : Northern Resource Exploitation, 1875-1951. Regina: Canadian Plains Research Center.

Fitchen, Janet M., Heath, Jenifer S., and June Fessenden-Raden. 1987. Risk Perception in
Community Context: A Case Study. In The Social and Cultural Construction of Risk: Essays on Risk Selection and Perception. Eds. Johnson, Branden B. and Vincent T. Covello. Pp. 31-54. Drodrecht: D. Reidel Publishing Company.

Fort McMurray Housing Needs Count Committee. 2004. Report on Housing Needs in Fort McMurray.

Freudenburg, William R. 1992. Addictive Economies: Extractive Industries and Vulnerable Localities in a Changing World Economy. Rural Sociology 57(3):305-332.

Fumoleau, René. 2004. As long as this land shall last: a history of Treaty 8 and Treaty 11, 1870-1839. Calgary, University of Calgary Press.

Garvin, Terry. 1992. Bush land people. Calgary: Arctic Institute of North America of the University of Calgary.

Geertz, Clifford. 1996. Afterword. In: Sense of Place. Eds. Feld, Steven and Keith H. Basso. Pp. 259-262. Santa Fe: School of American Research Press.

Goatcher, Sandy and Christy Nickerson. 2003. Alberta Profile: Social and Health Indicators of Addiction: Sixth Edition. AADAC Business & Policy Planning.

Golder Associates. 1996. Suncor Reclamation Landscape Performance Assessment. Prepared for Suncor, Inc.

Good, Byron J. 1994. Medicine, rationality, and experience: An anthropological perspective. Cambridge: Cambridge University Press.

Gifford, Sandra M. 1986. The Meaning of Lumps: A Case Study of the Ambiguities

of Risk. In Anthropology and Epidemiology: Interdisciplinary Approaches to the Study of Health and Disease. Eds. Janes, Craig R., Ron Stall and Sandra M. Gifford. Pp. 213-246. Dordrecht: D. Reidel Publishing Company.

Greider, Thomas and Lorraine Garkovich. 1994. The Social Construction of Nature and the Environment. Rural Sociology 59(1):1-24.

Hahn, Robert A. 1995. Sickness and Healing: An Anthropological Perspective. New Haven: Yale University Press.

Hammersley, Martyn and Paul Atkinson. 1995. Ethnography: Principles in Practice. London: Routledge.

Health Surveillance, Alberta Health and Wellness. 2000. The Alberta Oil Sands Community Exposure and Health Effects Assessment Program: summary report. Prepared for Health Surveillance, Alberta Health and Wellness. Edmonton.

Heidegger, Martin. 1988. The Basic Problems of Phenomenology. Revised Edition. Trans. Albert Hofstadter. Bloomington: Indiana University Press.

Himelfarb, Alex. 1982. The Social Characteristics of One-Industry Towns in Canada. In: Little Communities and Big Industries. Ed. Bowles, Roy T. Pp. 16-43. Toronto: Butterworths.

Hoffman-Mercredi, Lorraine D. 2002. Inkonze : the stones of traditional knowledge : a story of the Athabasca tar sands. Edmonton: Thunderwoman Ethnographics.

Huberman, Irwin. 2001. The Place We Call Home: A History of Fort McMurray, as its people remember. Fort McMurray: Historical Book Society of Fort McMurray.

Husserl, Edmund. 1999. The Idea of Phenomenology. Trans. Lee, Hardy. Dordrecht: Kluwer Academic Publishers.

Hutchinson, Brian. 2006. "Two tales of one city." National Post, April 1, 2006.

Ingold, Tim. 1992. Culture and the perception of the environment. In Bush Base, Forest Farm: Culture, Environment and Development. Eds. Croll, Elisabeth, and David Parkin. Pp. 39-56. London: Routledge.

Ingold, Tim. 1995. Building, dwelling, living: How animals and people make Themselves at home in the world. In Shifting Contexts: Transformations in Anthropological Knowledge. Ed. Strathern, Marilyn. Pp. 57-80. London: Routledge.

Kasperson, Roger E. 1992. The Social Amplification of Risk: Progress in Developing An Integrative Framework. In: Social Theories of Risk. Eds. Krimsksy, Sheldon and Dominic Golding. Pp. 153-178. Westport: Praeger.

Kasperson, Roger E, Ortwin Renn, Paul Slovic, Halina S. Brown, Jacque Emel, Roger Goble, Jeanne X. Kasperson and Samuel Ratick. 1988. The Social Amplification of Risk: A Conceptual Framework. Risk Analysis 8(2):177-187.

Langer, Monika M. 1989. Merleau-Ponty's Phenomenology of Perception: A Guide and Commentary. Tallahassee: Florida State University Press.

Lock, Margaret. 1998. Breast cancer: Reading the omens. Anthropology Today 14(4):7-16.

Luginaah, Isaac N., S. Martin Taylor, Susan J. Elliott and John D. Eyles. 2000. A longitudinal study of the health impacts of a petroleum refinery. Social Science & Medicine 50(8):1155-1166.

Luginaah, Isaac N., S. Martin Taylor, Susan J. Elliott, and John D. Eyles. 2002a. Community responses and coping strategies in the vicinity of a petroleum refinery in Oakville, Ontario. Health and Place 8(3):177-190.

Luginaah, Isaac N., S. Martin Taylor, Susan J. Elliott, and John D. Eyles. 2002b. Community reappraisal of the perceived health effects of a petroleum refinery. Social Science & Medicine 55(1):47-61.

Lupton, Deborah. 1995. The Imperative of Health: Public Health and the Regulated Body. London: Sage Publications.

MacGregor, Donald G. and Raymond Fleming. 1996. Risk Perception and Symptom Reporting. Risk Analysis 16(6):773-783.

Matthews, Eric. 2002. The philosophy of Merleau-Ponty. Montreal: McGill-Queen's University Press.

Marion, Jean-Luc. 1998. Reduction and givenness : investigations of Husserl, Heidegger, and phenomenology, Evanston: Northwestern University Press.

Merleau-Ponty, Maurice. 1962. Phenomenology of Perception. London: Routledge and Kegan Paul.

Mohanty, Jitendranath. 1997. Phenomenology: between essentialism and transcendental philosophy. Evanston: Northwestern University Press.

Nikiforuk, Andrew. 2001. Saboteurs: Wiebo Ludwig's War Against Big Oil. Toronto:

Macfarlane Walter & Ross.

Northern River Basins Study. 1996. Northern River Basins Study: Final Report. Edmonton: Northern River Basins Study.

O'Neil, John, Brenda Elias, Christopher Fletcher and Annalee Yassi. 1998. Cultural Rationality and Environmental Risk Perception in Northern Canada. In Issues in the North Vol. 3. Eds. Oakes, Jill and Rick Riewe. Pp. 13-28. Edmonton: Canadian Circumpolar Institute.

Parker, J.M. and K.W. Tingley. 1980. History of the Athabasca oil sands region, 1890 to 1960s. Volume I: Socio-economic developments. Prepared for the Alberta Oil Sands Environmental Research Program by Boreal Institute for Northern Studies, University of Alberta. AOSERP Report No. 80.

Regional Municipality of Wood Buffalo. 2005. 2005 Municipal Census.

Rockhill, Beverly. 2001. The Privatization of Risk. American Journal of Public Health 91(3):365-368.

Sajamo, Sepp and Matti Kamppinen. 1987. A historical introduction to phenomenology. London: Croom Helm.

Salazar, Mary K., Marie Napolitano, Jennifer A. Scherer, and Linda A. McCauley. 2004. Hispanic Adolescent Farmworkers' Perceptions Associated With Pesticide Exposure. Western Journal of Nursing Research 26(2):146-166.

Slater, Candice. 1995. Amazonia as Edenic Narrative. In: Uncommon Ground: Toward Reinventing Nature. Ed. Cronon, William. Pp. 114-131. New York: W.W. Norton & Company.

Slovic, Paul. 1986. Informing and educating the public about risk. Risk Analysis 6(4):403-415.

Slovic, Paul, Baruch Fischhoff and Sarah Lichtenstein. 1980. Facts and fears: Understanding perceived risk. In Societal Risk Assessment: How Safe is Safe Enough? Eds. Schwing, Richard C., and Walter A. Albers Jr. Pp. 181-214. New York: Plenum Press.

Spiegelberg, Herbert, and Karl Schuhmann. The phenomenological movement : a historical introduction. Hague: Nijhoff.

Stapleton, Timothy J. 1983. Husserl and Heidegger : the question of a phenomenological beginning. Albany: State University of New York Press.

Starr, Chauncey. 1969. Social benefit versus technological risk. Science 165:1232-

1238.

Suncor Energy Inc. 2006. Web site: http://www.suncor.ca

Syncrude Canada Ltd. 2006. Web site: http://www.syncrude.ca

Tibbetts, Paul. 1969. Perception: Selected Readings in Science and Phenomenology. Chicago: Quadrangle Books.

Van Maanen, John. 1988. Tales of the Field: On Writing Ethnography. Chicago: University of Chicago Press.

Wakefield, Sarah and Susan J. Elliott. 2000. Environmental risk perception and well-being: effects of the landfill siting process in two southern Ontario communities. Social Science & Medicine 50(10):1139-1154.

Westworth Brusnyk & Associates Ltd. 1996. Waterfowl, Raptors and Breeding Terrestrial Birds of the Suncor Lease in 1995. Prepared for Suncor Inc. Oil Sands Group.

White, Richard. 1995. "Are You an Environmentalist or Do You Work for a Living?": Work and Nature. In: Uncommon Ground: Toward Reinventing Nature. Ed. Cronon, William. Pp. 171-185. New York: W.W. Norton & Company.

Wildavsky, Aaron. 1988. Searching for Safety. London: Transaction Books.

Wildavsky, Aaron and Karl Dake. 1990. Theories of Risk Perception: Who Fears What and Why? Daedalus 119(4):41-60.

Wilkinson, Iain. 2001. Social theories of risk perception: At once indispensable and insufficient. Current Sociology 49(1):1-22.

Wrathall, Mark A. 1998. Intentionality Without Representations: Heidegger's Account of Perception. Philosophy Today 24:182-189.